ARCHIVES OF OTOLOGY.

SOME POINTS IN THE SURGICAL ANATOMY OF THE TEMPORAL BONE BEARING ON THE SPREAD AND CURE OF SUPPURATION.[1]

(ILLUSTRATED BY A COLLECTION OF OVER 525 TEMPORAL BONES.)

By ARTHUR H. CHEATLE, F.R.C.S., London.

(With eight illustrations on Text-Plates X–XIII.)

WHEN I received the great honor of an invitation from your President I accepted at once with pleasure, which on quiet reflection became tinged with the apprehension that I should fail to interest you. My sole claim to your attention is the collection of bones which I have brought with me, and I rely on the fascination which the temporal bone possesses with its many and important variations to relieve me from the apprehension I have expressed.

The collection of over 525 normal bones begins at the fifth month of fœtal life, and represents, often with reduplications, nearly every year of life up to the age of eighty years, and there are some above that age. The sex and age are given with the great majority up to No. 371; after that they are not known, but the specimens serve to show types and surgical anatomical peculiarities. They are mostly sectioned vertically through the antrum, mastoid process, and some part of the labyrinth.

[1] Address delivered before the Section on Otology, New York Academy of Medicine, May 25, 1908.

The catalogue I have had specially drawn up; at the end of it is a list of specimens, under headings which illustrate the points dealt with in the demonstration.

There are, no doubt, many points which I have not noted or have overlooked, and I shall be only too pleased to have my attention drawn to them or to make further sections which may be desired.

The anatomy of the temporal bone is, of course, the foundation of aural surgery. If the anatomical conditions were always regular half the fascination of the specialty would be gone.

The spread of suppuration depends largely on the type of bone affected, and it is, therefore, of the highest importance to know the possibilities when making a diagnosis or when operating.

I propose to deal with points in the anatomy of the bone bearing on the spread and cure of suppuration, and I will try to make the "dry bones live" with the help of lantern slides, craving your indulgence in speaking of matters which are perfectly well known to you.

If the temporal bone at birth be separated into its two main divisions, petrous and squamo-zygomatic, to which is attached the tympanic ring, the inner wall of the antrum is exposed above and behind the middle ear proper and is seen to be a regular and definite part of the middle-ear tract. This fact is easily demonstrated at the fifth month of fœtal life, when the inner antral wall appears as a smooth-walled recess above and behind the incus. The antrum, then, is laid down as a part of the middle-ear tract in fœtal life, and is not an outgrowth from what is ordinarily known as the middle ear. As the antrum is so regular in its formation it would be a curious thing if it were ever absent, and I may here state that I have yet to see a bone without it apart from congenital malformation. If the inner aspect of the posterior descending plate of the squamo-zygomatic portion be examined, its upper and back part, where it forms the

ILLUSTRATING DR. CHEATLE'S ARTICLE ON "SOME POINTS IN THE SURGICAL ANATOMY OF THE TEMPORAL BONE BEARING ON THE SPREAD AND CURE OF SUPPURATION."

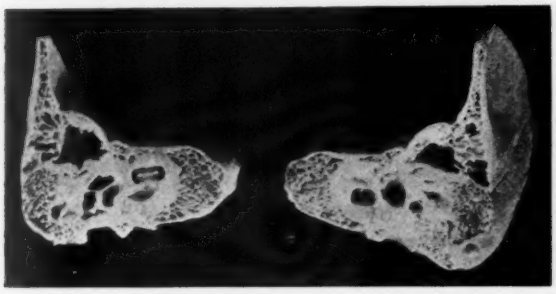

FIG. 1.—Left bone. Aged 6 months.

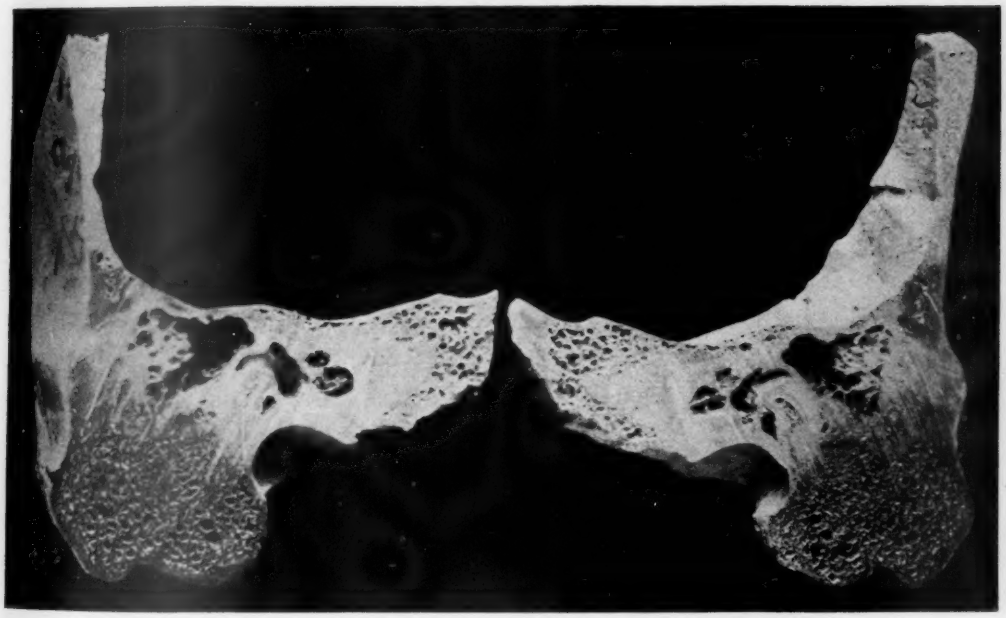

FIG. 2.—Right bone. Male. Aged 42 years.

outer wall of the antrum, is seen to be lined with a mass of fine cells having an inward direction. These cells are always present at birth and remain distinct from any cells which may form later in life. Even if the antrum is a mere slit in the adult they can always be seen and the cavity distinguished by their presence. It may be said that they are the most constant cells in the bone. They appear about the sixth month of fœtal life and are well marked during the seventh and eighth months. Such is their regularity that one cannot but think that they must have some physiological purpose. It may be that they serve to increase the lining membrane area. Many years ago Arbuthnot Lane suggested that the antrum acted as a reservoir for fluid which lubricated the middle ear and its contents. In front of these cells the bone is smooth where it forms the outer attic wall, and also below and behind them where it overlaps the mastoid mass of the petrous and subsequently helps to form the mastoid process. The amount of overlapping varies considerably.

If a lateral vertical section be made through the antrum and mastoid mass in infancy the latter is seen to be most frequently diploëtic, but it is sometimes dense. The outer antral wall is composed of a thin outer layer of compact bone having the lining of fine cells, which may be called the "fœtal cells." Separating the cavity of the antrum from the mastoid diploë is a thin layer of compact bone which is usually so well marked that the diploë can be scraped away, leaving the partition intact. (Fig. 1.)

As the infant begins to raise and move its head the mastoid process gradually forms for the attachment of the necessary muscles, and eventually consists of two parts, an upper non-projecting and a lower projecting portion which slopes upwards and backwards, the extent and character of the latter varying enormously; in some bones there is no free projecting part. That the process

forms only for the attachment of muscles and that any cells which may form do not possess any auditory function are strongly indicated by a case related by Purves Stewart (*Brain*, 1904, p. 89), in which the large neck muscles on one side were congenitally absent, with complete non-development of a mastoid process.

I have spoken of some anatomical details which I think are of importance in so far as they help us to understand some of the types of adult bones, which may be divided into:

TYPES OF TEMPORAL BONES.

1. *Infantile.*
2. *Cellular.*

1. *The infantile types* are those in which no invasion of the diploë by cells from the middle-ear tract has taken place.

(i) Diploëtic, in which the mastoid mass is diploëtic.
(ii) Dense, in which the mastoid mass is dense.

(i) The diploëtic:

In this type, the condition seen most frequently in infancy of an outer antral wall composed of an outer layer of compact bone with an inner layer of cells, a diploëtic mastoid mass between which and the cavity of the antrum is a thin layer of compact bone, persists all through life but in an exaggerated degree. The outer compact layer of the outer antral wall and the overlapping part below the antrum become thicker and remain extremely dense. The "fœtal cells" remain. The separating layer of compact bone between the cavity of the antrum and the mastoid mass becomes thicker and also remains extremely dense. The overlapping portion is often seen to be sharply marked off from the diploëtic mastoid mass, which increases in size as demanded by the muscles. (Fig. 2.)

In the collection this type forms about 20 per cent. of

FIG. 3.—Right bone. Adult.

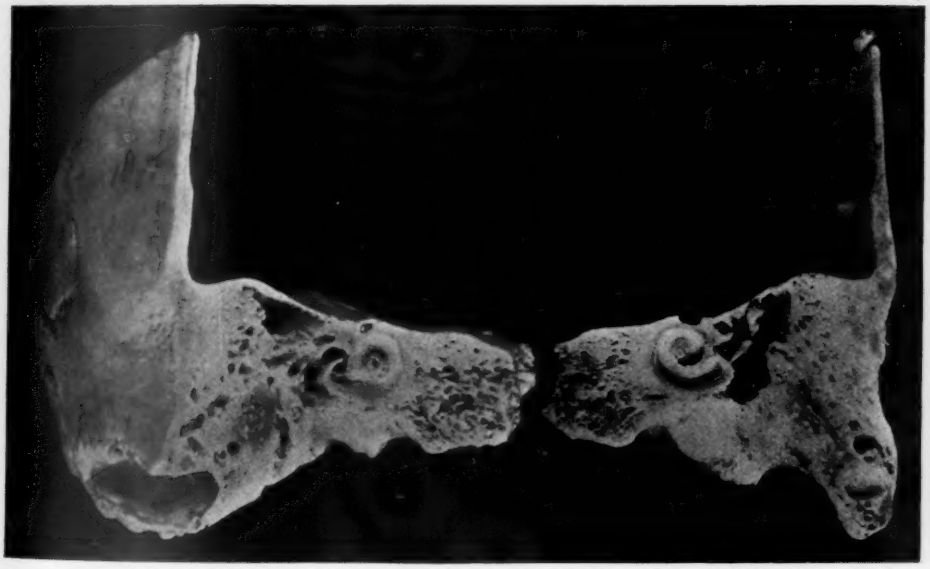

FIG. 4.—Right bone. Aged 18 years.

all normal bones above the age of five years, and it is represented in nearly every year of life.

In looking through these bones the absence of cells in other parts is remarkable. This dense condition of the outer antral wall is usually ascribed to osteosclerosis, but in the face of the frequent occurrence of the type in bones in which antral suppuration has not occurred, one cannot but think that the condition is a normal anatomical one.

In looking back, in my mind, over the cases in which I have performed the radical operation for chronic suppuration, it seems that this type has very frequently been met with, and I venture to suggest that the condition is not the result of chronic suppuration but is a factor in producing it. An acute inflammation in the antrum having been unable to find a vent to the surface through mastoid cells or outer antral wall has therefore remained pent up in the antrum, causing changes in and destruction of the lining membrane, with, perhaps, superficial caries of bone, causing a chronic discharge.

The antrum in this type may be large or small. It is sometimes, but by no means always, associated with a thin posterior wall which is translucent to the posterior fossa where the cerebellum or lateral sinus, or both, lie against it, as in the cellular type, and it seems to me that in many of the cases of the gravest intracranial complications due to acute or chronic disease this condition has been a distinct factor, for the disease, being unable to extend outwards or to attack the mastoid process, finds an easier path to the middle and posterior fossæ and to the semicircular canals, especially the outer one.

The deepest antrum occurs under these conditions, the outer antral wall in two specimens measuring three quarters of an inch.

The lateral sinus is more frequently forward and in its most exaggerated form than in the cellular types. In 71 bones in which I noted a forward sinus this type was

present in 40, and this is omitting those bones which have a few cells in the mastoid and a dense outer antral wall and, therefore, closely resemble the pure infantile type.

In one specimen the cerebellum pushes the posterior antral wall forward, causing the cavity to be narrowed antero-posteriorly.

The difficulty in operating on these bones is evident, and is much increased if the antrum is small and highly placed and a forward sinus is also present.

(ii) The dense:

Very rarely the mastoid mass is of great density in infancy, and so it may remain all through life, the condition of the outer antral wall remaining as in the diploëtic form. There are only seven specimens of this type in the collection. The surgical importance is precisely that of the more frequently occurring diploëtic form. (Fig. 3.)

The absence of cells in these infantile types is an added argument against the cells serving any auditory function.

2. *The cellular types.*

To clearly understand the possible distribution of cells throughout the bone it is necessary to study the diploëtic arrangement in infancy, for it may be stated broadly that ***wherever diploë is present in early life there may cells take its place later on.***

The diploë can be studied by sectioning the infant bone in various directions and at different levels. The distribution is by no means regular in every bone but the possible conditions are the important ones to consider.

There is always a large mass of diploë internal to the bony labyrinth occupying the whole thickness of the bone. I shall always allude to it as the "internal diploë."

We have seen that the mastoid mass is, in the great majority of bones, diploëtic. This mass is continued:

Backwards: over the lateral sinus.

Backwards and downwards: under the lateral sinus.

Backwards and upwards: behind the antrum and into

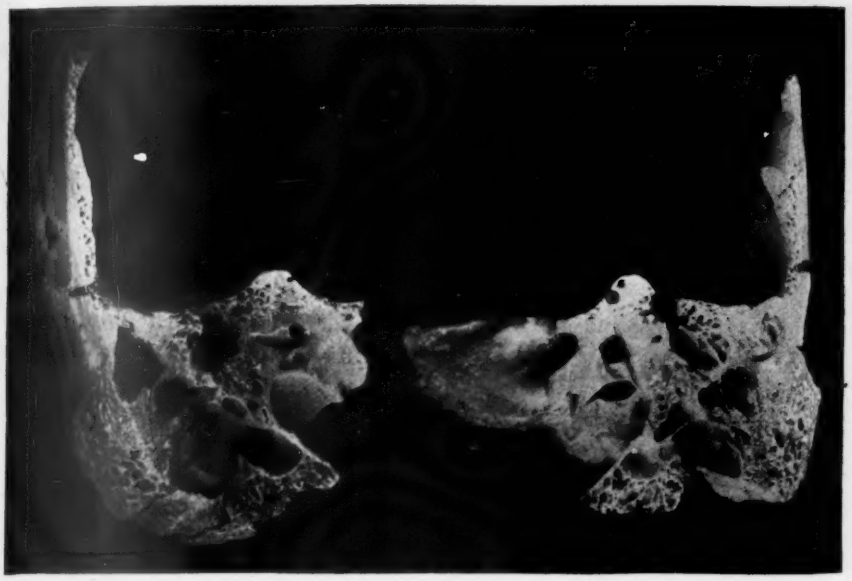

FIG. 5.—Right bone. Male. Aged 42 years.

FIG. 6.—Left bone. Male. Aged 18 years.

the posterior wall of that cavity, and is continued along the posterior surface of the bone as a very thin layer, leaving a gap for the internal auditory meatus and the aqueductus vestibuli and becomes continuous with the "internal diploë." That of the posterior wall of the antrum becomes continuous with that forming the inner antral wall.

Inwards: up to the descending part of the facial nerve and sulcus jugularis; or it may pass internal to these structures under the bony labyrinth and middle ear, passing over the sulcus jugularis and joining the "internal diploë."

Inwards and downwards: under the sulcus jugularis up to the occipital diploë, from which it is separated by a thin layer of compact bone.

The inner antral wall in the angle between the external, superior, and posterior canals is diploëtic, and this diploë may be continued through the loop of the superior canal, to join the "internal diploë." A thin layer runs over the superior canal and winds round its anterior extremity, and is continued superiorly inwards to the "internal diploë."

Diploë may be present almost surrounding the canal for the internal carotid canal, passing under the cochlea and joining the "internal diploë."

Diploë is also seen in the ascending part of the squama, in the roof of the meatus, and in the zygoma.

The possibilities, then, of cellular formation are very great, and are sometimes taken full advantage of. A large amount of diploë may, as we have seen, remain all through life, or it may be invaded by cells or thinned out by the pressure, during growth, of surrounding structures. The latter process is very well seen in the mass of diploë behind and above the antrum.

Every cell in the bone, with the exception of the "petrous cell," which will be dealt with later on, has its origin in the middle-ear tract, mainly from the antrum,

and each is directly or indirectly in communication with that tract and with one another—a point of great import when considering the possible spread and perforation of infection and when operating on the bone.

The connection of cells can be proved by the filling of the cells or middle-ear tract with water under pressure by means of a syringe. There is a great fascination in doing this with a series of cellular bones and observing the emergence of the water at apparently impossible places.

The age at which the mastoid cells first appear cannot be absolutely fixed. As far as I can ascertain from my specimens the usual thing is for them to commence, if they are going to form at all, about the age of five years; but there is a specimen, aged two years, in which cells are well formed; and in the bone of a child, aged one year and seven months, the commencement of the invasion is well seen. The cells are often seen at seven and eight years, and are usually well marked at ten years or soon after. As a matter of fact it is impossible to say what may be the condition of the interior of a bone after the first year of life.

It may be asked, When do cells cease to form? In my opinion they cease to form in young adult life—that is, as soon as the individual attains full growth, after which no further change takes place. The same amount of cell formation is seen in the young adult as in late life.

In the following descriptions of the cellular types it will be seen that the diploë may be partly or wholly replaced by cells. I have not dealt with them on that pure anatomical basis, but have preferred to illustrate the most frequent types and some of their variations as being more interesting from a surgical point of view.

It will be seen that the condition of the outer antral wall is taken into consideration in each type.

There are three situations in the middle-ear tract from which the diploë may be invaded:

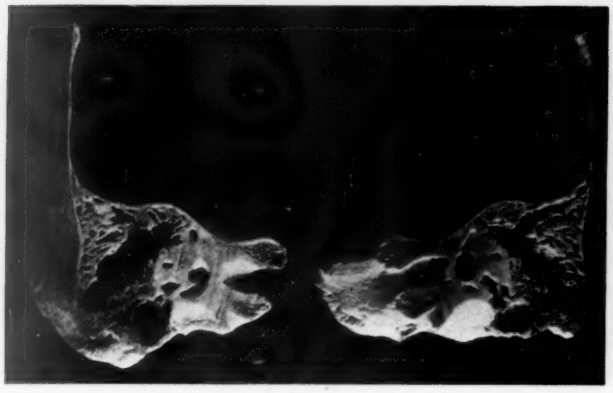

FIG. 7.—Right bone. Female. Aged 2 years.

FIG. 8.

(A) From the antrum.
(B) From the floor of the middle ear.
(C) From the top of the inner wall of the middle ear.

(A) Cells from the antrum:

The cells from the antrum may spread into the surrounding diploë from the floor and the outer, inner, and posterior walls, and along the line of the overlapping masto-squamosal suture.

(1) The outer antral wall may remain dense and cells form in the upper mastoid, sometimes along the line of the masto-squamosal suture only, the lower mastoid being diploëtic or dense. In the former case the line of division between the invading cells and the diploë is always well marked. This condition is closely allied to the pure diploëtic infantile type, and shares to a great extent its surgical importance.

(2) The outer antral wall may remain dense, and the cells extend throughout the mastoid process, but frequently with a rim of diploë at the extreme tip. Cellular mastoid processes of any form, in which diploë is completely absent, are comparatively uncommon; a thin rim is frequently to be seen at the extreme tip.

Rare variations of this type in the collection are:

(i) A narrow tortuous track with exceedingly dense walls passing throughout the process.

(ii) A narrow track of fine cells passing through the upper mastoid to a large cell or cells in the lower mastoid, the cell or cells having an extensive prolongation backward outside the lateral sinus, and over the digastric and occipital grooves where perforation into the neck might take place. (Fig. 4.)

So that a dense outer antral wall does not by any means always mean that cells are absent in the upper or lower mastoid, and care must be taken when operating that suppuration has not passed lower than the antrum.

(3) The outer antral wall may be cellular with cells in the upper mastoid, the lower mastoid being diploëtic

or dense. If there are cells between the outer compact layer of the outer antral wall and the inner layer of "fœtal-cells" there are always cells in the upper mastoid. These invasion-cells, as I have before stated, have a coarse appearance and a perpendicular arrangement, and are usually well marked off from the "fœtal cells," from which they probably are extensions.

Variations of this type in the collection are:

(i) A large cell, which might be mistaken for the antrum, in the outer antral wall immediately below the outer compact layer, with cells in the upper mastoid, the lower mastoid being diploëtic.

(ii) A large cell, which might be mistaken for the antrum, in the outer antral wall, communicating with coarse cells which pass downwards and inwards, internal to the mastoid process, and reach right down to the digastric fossa where the partition is very thin. These lower cells are bounded behind by a thin bony partition which forms the lateral sinus groove; they are also invading the occipital diploë. (Fig. 5.)

In this bone suppuration in the antrum would easily reach the neck without passing through the mastoid process. Luc and Urbantschitsch have published cases in which this condition probably existed, although I have seen one case of thrombosis of the lateral sinus in which an extra-dural abscess in the posterior fossa passed through the jugular foramen into the neck.

(iii) The outer antral wall and upper mastoid are cellular with one especially large cell coming to the surface at the extreme top of the inner aspect of the lower projecting part of the mastoid, forming another possible pathway for pus to reach the neck. The remainder of the process is diploëtic.

(4) Cells may be present in the outer antral wall and throughout the entire mastoid process, with or without a rim of diploë at the extreme tip.

In performing the radical operation in cases in which

the lower mastoid cells are involved, I think it is better to remove the whole projecting part instead of merely clearing it out; there is then subsequently no dependent part below the opening into the meatus.

For purposes of description further extension into the diploë may take place from the cells in:

(i) The outer antral wall.

(ii) The upper mastoid.

(iii) The lower mastoid.

(i) From the outer antral wall the ascending part of the squama may be invaded upwards and forwards, or the cells may extend over the meatus and into the zygoma, or they may extend backwards and upwards behind the antrum where occasionally a specially large cell is seen and called by Elsworth "the accessory antrum," although in reality it is merely a large cell. This backward extension communicates with upward extending cells from the lower mastoid. This extension may join cells from the posterior antral wall and reach the posterior semicircular canal, or it may pass over the canal and run right up to and invade the "internal diploë," leaving a gap for the internal auditory meatus and the vestibular aqueduct. It may join with extensions from the inner antral wall and pass through the loop of, rarely over, the superior canal and again join the extension to the internal diploë.

(ii) The upper mastoid cells may extend backwards over the lateral sinus joining above any backward extension from the outer antral wall and any from below. They may extend inwards up to the descending part of the facial nerve and to the sulcus jugularis if that structure lies high; or they may pass farther inwards round the nerve and, if the sulcus lies low, under the semicircular canals, internal auditory meatus, middle ear, and vestibule, and over the sulcus to the "internal diploë," and even invade it. It is important to remember from a surgical point of view that the sulcus

jugularis does not always retain its position against the posterior canal and vestibule. The cells may pass downwards and inwards under the lateral sinus and sulcus jugularis, and reach the occipital diploë and even invade it.

(iii) The lower mastoid cells often attain a very large size either as one large cell or a series of cells, for there is more diploë to spread themselves out in. They may extend backwards and upwards, joining cells from the upper mastoid which pass over and under the lateral sinus. They may extend inwards over the digastric and occipital grooves, forming a pathway for pus to reach the neck.

(B) Cells in the floor of the middle ear may pass under the vestibule and cochlea running up to or invading the "internal diploë," or they may line the inner wall and floor of the Eustachian tube, sometimes extending inwards behind and below the carotid canal, and reaching the "internal diploë"; so that the internal carotid artery does not always lie in contact with the cochlea—an important thing to remember when operating on the latter.

(C) Cells from the top of the inner middle-ear wall may run parallel to and join the extension from the floor, and so reach the "internal diploë."

Very rarely cells may extend in all directions and practically invade all the diploë. In one specimen even the "internal diploë" is replaced by cells and nearly the entire labyrinth surrounded, and so is the carotid canal. In this specimen the cells replacing the "internal diploë" are large, for here, as in the mastoid diploë, there is more room for their formation. (Fig. 6.)

THE "PETROUS" CELL.

There is occasionally seen a large cell, lined with compact bone, below and internal to the mastoid diploë and

just behind the descending part of the facial nerve, which, indeed, sometimes runs through it before emerging at the stylo-mastoid foramen.

At the fifth and sixth months of fœtal life a mass of cartilage occupies the anterior inferior aspect of the bone below and anterior to that from which the mastoid process is formed. As this cartilage becomes ossified the bone closes over to form the stylo-mastoid foramen, and leaves anteriorly this densely lined cell from which foramina open for the passage of vessels to the surrounding parts. It apparently forms in connection with the development of the facial, the chorda tympani, and the stapedius muscle canals. Sometimes there is an opening into the cell below and behind the stylo-mastoid foramen. The sinus tympani is sometimes in communication with it by a slit-like opening and sometimes appears to be part of it.

The cell must not be mistaken for one of the mastoid cells. (Fig. 7.)

Recesses in the Middle Ear.

The recesses seen in the middle ear are of importance as they may be filled with *débris* and require cleaning out when operating for chronic suppuration.

1. A recess is sometimes seen at the front part of the attic in front of the head of the malleus and above the canal for the tensor tympani. The facial nerve lies close to its inner wall.

2. A recess on each side of the pyramid on the posterior wall of the middle ear below the opening of the antrum, to the attic, is often seen.

They may be called the "external and internal pyramidal recesses"; the latter is known as the sinus tympani.

(i) The external pyramidal recess is not usually described, but a slight description of it was given by me

in the *Transactions of the Otological Society of Great Britain for 1900*, p. 45

If a fœtal bone at the eighth month be examined, the recess is seen on the outer side of the pyramid lying immediately outside the descending part of the facial nerve. The recess often dips down, forming a pocket; this condition is due to the posterior part of the floor of the middle ear turning up and ending as a free border, the inner edge of which is attached to the outer side of the pyramid. This pocketing may be seen in the adult.

The recess may run right outside the facial nerve and communicate with cells farther out.

Occasionally a spicule of bone runs from the edge of the bony meatus to the pyramid across the opening of the recess, and is evidently meant as a support to the pyramid, as is the spicule which is so frequently seen passing from the inner side of the pyramid to the promontory. Occasionally the spicule is replaced by a ledge.

(ii) The internal pyramidal recess or sinus tympani varies exceedingly; it may be a shallow recess crossed at its upper part by the pyramid-supporting spicule of bone, which, by the way, may be double; or it may be much deeper, running right behind the facial nerve under the external canal and coming into relationship with the posterior semicircular canal. Often it runs right up to the outer wall of the vestibule, which may be translucent, below and behind the oval window. Its floor may be formed by a high sulcus jugularis, or it may dip down as a pocket well below its opening into the middle ear and abut on a low-lying sulcus jugularis, or run alongside its outer wall. A foramen is occasionally seen in the floor leading to the sulcus jugularis, evidently for the passage of a vein. As before stated, it sometimes communicates and apparently becomes part of the "petrous cell."

The recess, therefore, has very important relationships.

In many instances attempts to thoroughly clean it through its opening with instruments must result in injury to the facial nerve, and the question is whether the risk of infection spreading from it warrants the risk of facial paralysis. It might be just possible to pass a very fine bent probe through its opening and by that means to gauge its extent and direction, and if it is a large cavity it is possible to open it below the projecting loop of the external canal and behind the facial nerve.

Projection into the Roof of the Middle-Ear Tract of the Free Edge of the Underlying Squamous Portion of the Petro-squamosal Suture.

The roof of the middle-ear tract, especially of the antrum, is usually divided into an inner and outer part by the free edge of the squama at the petro-squamosal suture projecting into it.

Cells are often seen on each side of it, the inner ones often being hidden. It is therefore always necessary to remove it when operating in order to clean the inner part.

The Lateral Sinus.

In infancy the sinus lies in a horizontal manner below and behind the mastoid mass, being separated from it by dense diploëtic bone rendering infection unlikely below the age of six months.

As age advances it becomes more vertical, and as the intervening diploë becomes lost partly by the pressure of the intracranial structures, the sinus may come into closer relationship with the antrum and mastoid process; or the diploë may be invaded by cells, in which case the sinus usually remains far back. As we have seen, a forward sinus is more frequently seen in the infantile types than in the cellular.

No surgical reliance can be placed on the statement

that a right sinus is larger and more likely to be forward than a left one; for it may be quite small and far back on the right side and very large and forward on the left, in fact the largest and most forward sinus in the collection occurs on the left side. A forward sinus is not necessarily a large one.

When it is forward it may run right up to and groove the posterior antral wall, or it may dip in between the cavity of the antrum and the surface, but I have never seen it quite occupying the position of the suprameatal triangle, although very nearly. In one specimen it partly overlaps the antrum and is separated from the external surface just behind that cavity by a roughly circular patch of thin translucent bone.

It may run right up to the posterior meatal wall below the antrum or shut out its apex, especially if that cavity is highly placed. There is sometimes a thin track of diploë or cells in the upper mastoid running anteriorly or internally to the sinus and reaching a larger mass of diploë or cells in the lower mastoid.

There is no guide as to the position of the sinus except that the dark color may sometimes be seen through the bone, especially in children.

A very marked forward sinus is present in a child aged three years and in another aged seven years.

A large sinus does not necessarily mean that the jugular bulb and sulcus are also large, for if a large mastoid vein is present they may be much reduced in size as a result.

In one specimen a curious condition is present in the interior of the vertical part of the sinus; a vertical membranous septum, half an inch in length, divides the vessel into two parts. Such a septum is, fortunately, rare, for it might be very awkward in dealing with septic thrombosis. There is no reason why septa should not occur, for the sinus is developed from cavernous spaces in the same way as the longitudinal sinus in which they are more commonly seen.

The Mastoid Emissary Vein.

This vein is of importance as it sometimes shares in septic thrombosis of the lateral sinus and requires dealing with, and it is a nuisance sometimes when extending the bony wound to explore the cerebellum.

It is very variable; rarely it is absent. In size it varies from a thread to a pencil. It usually comes off from the sinus directly to enter its bony canal, through which it takes a curved course before opening behind the base of the process; often, however, it runs along the inner surface for some distance before entering the bone.

The point at which it comes off from the sinus varies; usually it is high up, sometimes it is low down.

It always adopts a curved course before emerging, as do all the veins coming from the base of the skull. The channel through the bone may be an inch in length.

The point of emergence also varies; the usual place is behind and below the base of the mastoid, but it may be much lower, in the back part of the digastric or occipital grooves or below and behind them.

Frequently it is double, either beginning as two vessels or beginning as one and dividing in some part of the long course, sometimes immediately, at others farther in, or at the actual point of emergence. The two external openings may be close together, or one may be high up and one low down.

The Sulcus Jugularis.

The sulcus may retain its infantile position, lying against the middle ear and bony labyrinth, or it may become separated from them by cells or by compact bone increasing to three-quarters of an inch in thickness. If it remains high it may push upwards, bulging up the floor of the middle ear, and form the floor of the sinus tympani. The roof of it is sometimes divided into two recesses. It may push outwards to the descending part

of the facial nerve, which may actually run through the outer wall, and come to about half an inch from the surface of the upper mastoid. It may reach to the mastoid cells, as has been seen.

On the posterior aspect of the bone it may reach up nearly as high as the posterior border lying under the aqueductus vestibuli and saccus endolymphaticus, and it may extend outwards almost reaching the lateral sinus groove.

It is curious how rarely infection spreads through the middle-ear floor to the jugular bulb, a remark which also applies to the internal carotid artery.

A very up-pushing sulcus need not necessarily mean a large one.

An important question is, how can it be reached in order to deal with an infected jugular bulb? There are three ways from a purely anatomical point of view:

(1) Through the outer wall.

(2) Through the posterior wall.

(3) Through the postero-external angle.

(1) To reach it satisfactorily through the outer wall, the whole mastoid process, the floor of the meatus, and the intervening bone more internally must be removed. This is a very difficult procedure and must mean destruction of the facial nerve.

(2) To approach the posterior wall of the sulcus the patient should be turned on his face with the forehead resting on a separate support, and the head well flexed and a flap turned down behind the mastoid process so that the muscles can be detached until the posterior edge of the jugular foramen is reached. As a broad rule this would mean that the muscles and periosteum would have to be detached as far as a line drawn horizontally inwards from the posterior edge of the bony meatus. This line usually runs through the stylomastoid foramen and the posterior edge of the jugular foramen. To make more room the mastoid process could be entirely removed.

(3) The postero-external angle is perhaps the best point of attack. The head should be well flexed and turned away from the surgeon and the sinus followed down. Removal of the projecting part of the mastoid process will give more room.

The Petro-squamosal Sinus.

This sinus is of importance as being a possible carrier of infection either through the blood-stream or through the perivascular lymphatic spaces.

It runs along the petro-squamosal suture, sometimes deeply grooving the bone, and enters the lateral sinus by a valve-like opening. It may open anteriorly between the post-glenoid tubercle and the bony meatus, in the outer end of the Glasserian fissure, in the glenoid cavity, or in the zygoma; like all venous channels leaving the skull, it has a bend before it emerges on the surface.

It receives branches, having a meningeal covering, from the middle ear below, and from the meninges and temporo-sphenoidal lobe above.

I have not infrequently seen cases of infants dying with purulent meningitis, and at the autopsy the middle ear on the side affected has been found full of pus and with an intact membrane, and there is no doubt in my mind that the sinus and its branches have served as carriers. Dr. A. Cleveland, of Philadelphia, was the first, I think, to record a case of septic thrombosis of the sinus with spread to the lateral sinus (ARCH. OF OTOLOGY, vol. xxiv., p. 136).

In my opinion the sinus and its connection are also responsible for the temporo-sphenoidal abscess which forms in the substance of the lobe without direct extension of disease.

Instances in which Macewen's Triangle is Fallacious.

In the great majority of cases the triangle is a sure

guide, but we have seen that the lateral sinus may encroach on the posterior line and apex. The upper or base line may also be fallacious. The antrum may be wholly above it and finding the cavity may be difficult, especially if it is small and is associated with a forward sinus. The high condition is seen in both the infantile and cellular types, but in the former a forward sinus is more to be expected. The cavity may be only partly above the line—a condition which does not present much difficulty, as the lower part of the cavity is exposed through the triangle and a probe carefully used will tell the tale. There is no guide on the surface to warn us in either condition. A rare condition is for the antrum to be highly placed and yet the middle fossa dips down externally to it, forming a particularly annoying state of things. A high antrum is comparatively common.

More rarely—in only twelve bones in the collection—the middle fossa dips down externally to the superior semicircular canal, especially in hydrocephalic skulls, causing the triangle to lead to dura mater. This dipping down may occur immediately outside the superior canal, causing a low flat antrum, or the outer part of the roof of the antrum may be pushed down, causing a sloping narrow cavity.

The depression may occur outside the antrum, in which case the cavity may really correspond to the triangle, but the dura mater intervenes.

A forward sinus is seen in this condition but not to an extreme degree.

It can be seen in these bones that the posterior zygomatic line has a bulging appearance and that the bone below it has a marked inclination inwards. Such conditions are the only guides to an abnormal relation of the antrum to the triangle which I am aware of, and even these may be fallacious.

The moral to be drawn from all these variations is to operate as if they were expected.

The Suprameatal Spine.

The spine points directly inwards to the lower part of the opening of the antrum into the attic, which opening is always above its level.

Operative Guide to the Descending Part of the Facial Nerve.

When removing the posterior meatal wall down to the level of the floor of the meatus the facial nerve is in some danger; to obviate it Hugh Jones, of Liverpool, has given us a most useful guide.

If an imaginary line be drawn from the outermost part of the exposed external semicircular canal to the highest point of the floor of the meatus it will always have the nerve internal to it, and therefore the bone outside it can safely be removed.

The descending part of the nerve does not always run straight down or with an inclination outwards, for in one specimen it curves inwards after leaving the external semicircular canal with a final outward bend before emerging at the stylomastoid foramen. (Fig. 8.)

Some Curiosities.

(1) A small exostosis on the inner aspect of the body of the incus.

(2) A gap, apparently for a vessel, on the outer surface of the mastoid process leading to the cells.

(3) A fissure runs through to the outer and upper corner of the bone marking off the outer antral wall. The cause of the condition is doubtful: a healed fracture (?).

(4) Ossification of the stylohyoid ligament.

(5) Among the series of fractures is a bone with what looks like another oval window below the normal one. Instead of the lower edge of the oval window being bounded below by the promontory, its place is taken by a thin horizontal bar of bone below which is an almost

identically shaped gap. The promontory and round window are set farther forwards, so that some part of the membranous labyrinth must have been in contact with the lining membrane of the middle ear. There is no doubt that the fracture had nothing to do with the condition.

(6) Marked "lipping" of the edges and suture and irregularities on the outer surface of the mastoid process are well seen in at least five bones, and in one the round window is partially obliterated by a process of bone passing downwards from the promontory. The condition suggests a rheumatoid affection.

IMPROVEMENTS OF THE RESPIROMETER AND ITS DISINFECTION.

By CHARLES AUBREY BUCKLIN, A.M., M.D.,
New York.

THE uses of the respirometer for deciding when an operation is necessary, the amount of effect required, and the elevation of the atmospheric relations attained as the result of operations for diseases of the respiratory tract, have been published.[1]

The latest respirometer represents a large amount of experimental research. It consists of a glass tube 40½″ in length, ⅜″ in diameter, with a bore ⅛″. To each end of this tube is fitted a stiff piece of rubber tubing 3″ in length, which extends ¼″ beyond the ends of the glass tube. A notch ⅛″ in diameter and ⅛″ in depth disposed at right angles to the bore is burned into the end of each piece of rubber tubing with the aid of a hot wire nail. At thirty inches above each notch is placed the lower margin of a ring of rubber tubing ⅛″ in breadth. In the middle of the glass tube is placed a ring of rubber tubing ½″ in breadth. The projecting pieces of rubber tubing give perfect protection against breakage at the ends. They also protect the patient's mouth from injury by contact with the bare ends of the glass tube. An end piece of this rubber tubing is always introduced into the patient's mouth, depressing the tongue. The lips should grasp the lower end of the upper piece of rubber tubing.

[1] Arch. of Otology, vol. xxxvi., No. 4, 1907, p. 398.

The respirometer enters the mouth 3″ every time it is used. This prevents the soft palate and the tongue from closing the instrument from the suction occasioned by a nasal inspiration.

The ½″ central rubber ring protects the glass tube from breaking while in the disinfecting case. With these five pieces of rubber tubing the respirometer is protected sufficiently to be carried by the surgeon without accident. It cannot be transported in a trunk. The ⅛″ rings are used to indicate the distance to which water is raised above or below their lower margins. This distance is measured when the examination is made.

A clean glass tumbler in which is placed ½″ of water is set on the floor and into this tumbler one end of the respirometer is immersed. The patient is requested to expire thoroughly through his mouth; he is then asked to take the lower end of the upper rubber tube air-tightly between his lips and to make the strongest, quickest nasal inspiration possible. The water is raised to about 37″ in the average case of hypertrophic nasal catarrh which represents a vacuum upon the respiratory tract of one and thirty-six hundredths pounds to the square inch. The height to which water is raised in the glass tube during this forced nasal inspiration provides for the estimation of the vacuum formed in the respiratory tract. No attempt should be made to use glass tubing with less than ⅛″ bore. Where it is too minute a column of water will be raised which is too small to be distinctly seen, and the time required for it to rise to the height corresponding to the vacuum formed will be sufficient to defeat the object for which the respirometer was constructed.

Disinfection of the Respirometer.—This is the subject upon which most of the experiments have been made. Experiments have shown that steam cannot be used to disinfect the tube as the effect of the steam on the rubber is to produce an opaque deposit on the glass and the heat is likely to crack it.

Every possible metal has been tried for the purpose of making a disinfecting case which will hold a solution of bichloride of mercury without decomposing this chemical, but they all cause it to be destroyed by precipitating the mercury and the acid attacks the metal.

A disinfecting case made of vulcanized rubber $\frac{5}{8}$″ in diameter, with a bore of $\frac{1}{2}$″ and a length of 42″, was finally found to be satisfactory in every respect. The bottom cap closing this piece of hard rubber tubing was screwed on and cemented while the top cap was so adjusted that it could be manipulated with the fingers.

An aqueous solution of bichloride of mercury is made containing two commercial tablets to each fluid ounce of water used. These tablets are of the strength of 1 to 1000 when one is dissolved in a pint of water. This makes the solution used of a strength 1 to 31.25. This solution is placed in the disinfecting case to a height sufficient to cover the glass tube. In two minutes the infectious properties of all germs that can become lodged on the respirometer are destroyed.

A water bottle or pitcher is filled with fresh water into which is immersed for one minute the end of the respirometer which is to be placed in the patient's mouth. This will remove the chemical sufficiently to prevent any injury to the patient. This chemical can be tasted quite as distinctly when diluted with water in the proportions of 1 to 100,000 as it can after this immersion.

The disinfecting solution should be securely confined in the disinfecting case by screwing the cover tightly down. In this event the glass tube is less likely to be broken. A pipe wrench 6″ in length should be kept for unscrewing this smooth rubber cover which is usually screwed tightly down.

With the respirometer, one can measure the effect produced by any operation for nasal obstructions and the surgeon is placed in immediate possession of the

facts upon which to base his praise or criticism of the operations performed.

The author has determined by experiment that to treat hypertrophic nasal catarrh and most of its complications, it is necessary to reduce the patient's ability to raise water in the respirometer to about one half the distance that it was raised before treatment commenced. This is usually accomplished by a complete removal of all deformities of the septum and a partial turbinectomy of the most prominent lower turbinated, or both lower turbinated bones may require partial removal to meet the necessary requirements. The coverings of these bones are always affected with hypertrophic nasal catarrh.

In complications where neurotic peculiarities are features of the diseases, as hay fever and asthma, it has been found necessary to perform a double partial turbinectomy upon the lower turbinated bones for the purpose of reducing the ability to raise water in the respirometer to one-fourth what it was before treatment commenced.

The double operation is necessary for successful treatment of the diseases hay fever and asthma. They are usually benefited in about three months after the proper operations have been performed. The elevation of the atmospheric relation is computed according to the following facts. When at the sea-level the atmospheric pressure is fifteen pounds, physics states that at three miles' elevation the pressure is seven and one-half pounds.

Were experiments with the respirometer to be made with the pressure reduced to seven and one-half pounds, the water could be raised to only one-half the height it was raised with double this pressure. Three miles reduced to feet are equal to 15,840. You consequently divide this number of feet by half the number of inches that the patient is able to raise water in the respirometer at the commencement of treatment and the quotient

represents the number of feet in elevation which corresponds to each inch the patient's ability to raise water in the respirometer has been reduced as the result of the nasal operations.

The respirometer is commended for the purpose of settling disputes among the profession as to whether an operation is necessary and when a satisfactory or an imperfect operation has been performed for nasal obstructions.

Should a patient be able to raise water to 36″ and operations reduced this ability to 18,″ he has had his atmospheric relations elevated three miles; should it have been reduced to 9″ they would have been elevated to four and one-half miles.

The author has demonstrated, by clinical experience, that equalizing the differences between external and internal pressures during inspirations has the same beneficial effect upon the health of the patient, no matter in which manner they are equalized. When produced through an elevation of the altitude, the patient must change his residence to a place where it may be inconvenient for him to live; when equalized by properly enlarging the nasal passages, the patient may select his residence wherever he finds it convenient to live.

The average man will not find business opportunities as numerous or advantageous at an elevation of five thousand feet, as they can be found in the remainder of the world.

THE INCREASE OF THE SPECIFIC GRAVITY OF PUS IN OTITIS MEDIA SUPPURATIVA ACUTA AS AN INDICATION FOR OPENING THE MASTOID PROCESS, AND THE ERRORS CONNECTED WITH HAMMERSCHLAG'S METHOD.

By P. TETENS HALD, M.D., Copenhagen.

Translated by Dr. Gerhard H. Cocks, New York, from *Zeitschr. f. Ohrenheilk.*, Vol. LIII., p. 281.

KNOWING how difficult it is to decide when to open the mastoid process in the course of an acute middle-ear suppuration, af Forselles has attempted to find a new and exact diagnostic aid. He believes the estimation of the specific gravity of the pus furnishes this indication.

We do not refer to the cases with abscess or fistula behind the auricle, sagging of the posterior superior canal wall, intracranial complications, or facial paralysis, where we naturally operate without delay. Nor do we wait long when we find protracted pain in or behind the ear, even though drainage through the perforation in the drum is free.

What is the proper course to pursue in those cases where the mastoid process appears absolutely sound, and nothing abnormal can be elicited by palpation or percussion, where the above mentioned series of symptoms is completely lacking, and the patient sleeps and eats as usual, in fact, appears to be perfectly well, apart from the suppuration and hardness of hearing? Here

it is often difficult to make up our mind to operate, and yet the operation, when finally performed, demonstrates extensive destruction of the mastoid process, with perhaps exposure of the sinus or dura. In such cases we are guided by two symptoms. One is that the suppuration continues to be profuse notwithstanding the fact that a moderately long interval (three or four weeks) has elapsed since the beginning of the disease. The other is that the purulent secretion assumes a more cream-like consistency, because it contains a relatively greater quantity of pus cells. Although these two symptoms indicate in all probability a condition of the mastoid which is unlikely to heal without operative interference, still we are often uncertain, and postpone operation. Yet it is surely better to operate once too often than to delay once too long. We shall therefore welcome any new symptom which will help us decide these doubtful cases. Such a sign, as I have said before, af Forselles believes he has discovered in the estimation of the specific gravity of the pus found in the external auditory canal.

In a treatise published in 1905, he gives the results of his investigations in the following words: "For the reasons given above I have come to the conclusion that if, in the course of an acute middle-ear suppuration the specific gravity of the pus goes above 1.045 the occurrence of an empyema of the mastoid process may be suspected, and if it reaches 1.046–1.047 or higher, I hold the diagnosis certain."

To judge by these precise instructions, we would suppose that af Forselles had succeeded in finding an unusually valuable objective symptom. The value of his work decreases, however, when we come to study his technique. Af Forselles has made use of Hammerschlag's method for the estimation of specific gravity of blood and serum. I shall cite verbatim the description of this method as described by af Forselles.

"The other method is the indirect method of Hammerschlag. It is carried out as follows: a mixture is used composed of two fluids, for example, chloroform and benzol or benzin, the one of which is heavier, and the other lighter than the exudate to be examined. If now a drop of the exudate is placed in the mixture, and chloroform or benzin added, as is needed, the drop of pus is held in suspension at a certain level, provided the mixture has the same specific gravity as the exudate. The specific gravities of the mixture and of the exudate are now determined areometrically."

"The method is very convenient, and gives fairly accurate results. Moreover it does not require a laboratory or costly instruments, and may be carried out in a few moments. I shall now describe this method as I have practised it."

"In estimating the specific gravity of the ear-secretion, we need a bottle (fitted with a dropper) for chloroform, and another bottle for benzin. We must also have a cylindrical glass about 10*cm* high and 1½*cm* in diameter, an areometer, and a flask for mixing chloroform and benzin. I use a mixture of seven parts benzin and five parts chloroform. The specific gravity of the mixture is about 1.020. The secretion in the canal is sucked into a capillary tube. The cylindrical glass is filled two-thirds full with the mixture. A drop of pus is blown from the capillary tube into the mixture. The glass is stoppered with the finger and rotated once. If the drop of exudate sinks to the bottom, chloroform is added drop by drop; if it floats, benzin is added. In most cases we may add the chloroform quite rapidly at first. It sinks to the bottom and mixes with the fluid until the drop of exudate shows a tendency to move. We must then add the chloroform more carefully, until the exudate is held in suspension. If the exudate floats on the surface, it is necessary to add a few drops of benzin, and after each addition to close the cylinder with the finger and revolve

it once, since the benzin will otherwise remain at the surface. If now the drop of exudate stays at a certain level in the mixture, the areometer is quickly placed in the fluid and the specific gravity read. I do not first remove the drop of pus, for this consumes time. However, we should see that the pus does not adhere to the areometer. The mixture is then filtered, and preserved for future use in the flask containing the chloroform-benzin."

Since af Forselles has not given any other directions, either in the above description, or in his book, I am forced to conclude that he is not acquainted with the important faults in his technique. Accurate results can only be obtained by familiarity with those errors. I shall now give the faults connected with Hammerschlag's method and speak of their importance; I shall further show how they may be eliminated in the easiest way. Finally, I shall mention, in brief, my views upon the probability of being able to recognize, by means of such an examination, the indications for opening the mastoid process.

I.—ERROR CAUSED BY THE DIFFERENCE BETWEEN THE SURFACE TENSIONS OF WATER AND BENZOL-CHLOROFORM.

If an areometer floats in a fluid, *e. g.*, water, the surface tension of the fluid exercises a downward tug on the spindle, so that the instrument sinks until it has displaced not only its own volume of water, but also sufficient water to equalize the force exerted by the surface tension. As the surface tension of the B.C. mixture = about one-third that of water, the areometer reads too high.

This error is constant for the same areometer, but inconstant for instruments of different sizes, as shown in the following table by A. G. Levy.

Number of areometer.....	1	2	3	4
Weight in grams.....	15.3	11.4	3.8	2.9
Diameter of spindle in *mm*	3.95	4.37	3.55	3.13
Error.....	0.003	0.005	0.012	0.013

The smallest of these instruments (No. 4) reads 0.013 too high in benzol-chloroform; *i.e.*, it indicates a specific gravity of 1.043 instead of 1.030. It is probable that af Forselles used an instrument corresponding to No. 3 or No. 4 in this table, consequently his error amounts to about 10 divisions.

II.—ERROR CAUSED BY THE ESTIMATION BEING MADE IN DIFFERENT TEMPERATURES.

This error, though slight, is too high to disregard, as Hammerschlag advises. As is well known, most bodies expand in an increasing temperature, different bodies quite differently for the same temperature. When the pus in the benzol-chloroform expands, its specific gravity naturally diminishes. The amount of this change in density depends upon the size of the coefficient of expansion of the pus, which I have estimated at 0.00018. I would therefore suggest that for every 5° which the observation temperature differs from that of the temperature at which the estimation is usually made (15°), the reading of the areometer be raised or lowered by 0.001 as called for.

III.—ERROR CAUSED BY A PORTION OF THE BENZOL-CHLOROFORM PENETRATING THE DROP OF PUS.

The specific gravity of the pus diminishes considerably if the drop remains longer than a minute in the benzol-chloroform. This is caused by the benzol penetrating the droplet. Hence I agree with Zuntz that the determination should be performed in the shortest possible time.

The first error, caused by the difference between the surface tension of water and that of benzol-chloroform, may be estimated by the following formula, suggested by Fock.

$$\frac{2\pi ra}{V}$$

Here $2r =$ the diameter of the spindle measured in centimetres, a the amount of surface tension in grams, and V the volume in *cc* of that portion of the areometer which sinks into the fluid. V may represent with sufficient exactness the weight of the areometer in grams. Since a for water = 0.0077, and for benzol-chloroform = 0.0028, according to the reading of my urometer for r and V, the surface tension of water will lower the reading of my instrument eight divisions, while the benzol-chloroform mixture only lowers it three. Consequently it is necessary to subtract 0.005 from the result obtained.

Af Forselles has used a benzin-chloroform mixture in his experiments. Experience has shown me that this acts exactly the same as benzol-chloroform. I have preferred to use benzol instead of benzin, as the former has been employed by almost all investigators, and is a body of known physical and chemical properties.

Af Forselles gives the indication for operative interference as follows: "If in the course of an acute suppurative middle-ear inflammation the specific gravity of the pus mounts above a certain level, which is higher than normal, it denotes the presence of an empyema of the mastoid process, and is therefore an indication for operation." (By empyema of the mastoid af Forselles means pus under pressure.) He believes that this increase in the specific gravity is due to the formation of granulation tissue in the mastoid cells, especially when drainage through the tympanum is not good.

There are several factors to be considered which throw discredit on this theory.

In the first place it is highly improbable that diseased

tissue in the mastoid cells invariably produces a secretion whose composition (with respect to the relative number of pus cells) is so constant that the specific gravity always remained above a certain level.

In the second place we cannot be certain that the pus found in the external auditory canal originated in the mastoid cells and not in the tympanic cavity.

Thirdly, the pus, while lying in the canal, may be altered by evaporation, by absorption of its fluid elements in the dressings, and by the addition of macerated epithelium from the canal wall.

Résumé.

1. The statistics of af Forselles for the specific gravity of pus in the course of acute suppurative otitis media are incorrect and too high.

2. If the specific gravity determinations are made by Hammerschlag's method, certain rules, above described, should be followed.

3. It is extremely doubtful if we can correctly diagnosticate empyema of the mastoid process by the estimation of the specific gravity of pus taken from the auditory canal.

REPORT OF THE SEVENTEENTH MEETING OF THE GERMAN OTOLOGICAL SOCIETY AT HEIDELBERG, JUNE 6 AND 7, 1908.

By Dr. J. HEGENER, Heidelberg.

Translated by Dr. Percy Fridenberg, New York.

1. O. Koerner (Rostock): **Conservative treatment of chronic middle-ear suppuration.** The term conservative applies to all procedures which can be used through natural channels (meatus, Eustachian tube) whether surgical, *e. g.*, ossiculectomy, or otherwise. Not every case of chronic purulent otitis is dangerous. Suppuration may be limited to the epitympanum, and the curative value of osteosclerotic processes has been shown by the findings at numerous radical operations. For this reason the prophylactic indication of the radical operation has been given up, and the latter must be justified by the presence of certain definite symptoms of actual danger. The most important and valuable of conservative measures is the regularly repeated and thorough cleansing of the tympanic cavity by syringing, if necessary, through a middle-ear canula. Of antiseptics hydrogen peroxide in solution may be of some value on account of its energetic mechanically cleansing effect. Boric acid powder is to be used with caution, and by the surgeon only, in case of a small perforation. Solutions of silver nitrate and alcohol are very serviceable in case there is much swelling of the mucous membrane. Rough spots on the promontory which delay healing are to be smoothed off with the burr. The removal of necrotic or partially detached ossicles facilitates treatment by making the depths of the tympanum more accessible and drainage more easy. The removal of nasal

or pharyngeal foci of suppuration is of great importance in preventing reinfection of the middle ear. Even chronic suppuration in the mastoid antrum may be completely cured by persisting in this syringing method as long as the disease process has remained limited to the mucous membrane and has not involved the bony walls of this cavity or of the neighboring mastoid cells.

The form associated with immigration of epidermis, otitis media desquamativa, requires thorough removal of the suppuration for a cure, and this can be effected by conservative measures only if the purulent process is limited to the epitympanum. If there is not evident and rapid progress and it appears that the masses come from the antrum, the latter cavity should be freely opened. Besides the local treatment, the constitution of the patient must be considered.

2. SCHEIBE (Munich): **What can we expect from conservative treatment of chronic middle-ear suppuration?** After defining chronic suppuration, Scheibe quotes statistics, which he considers very valuable (as opposed to Koerner) to prove that in the course of a chronic middle-ear suppuration Bezold's boric-acid-powder treatment and the methodical use of the antrum canula may be relied upon implicitly to prevent any mastoid involvement or intracranial complication. These unusually favorable results are confirmed by the experience of Bezold and Siebenmann. Wilde's law can no longer be upheld. Koerner, too, has opposed its validity in regard to central, in contradistinction to marginal, perforations. Of 50 cases of chronic middle-ear suppuration, only 1.5% failed to respond promptly to expert treatment by repeated and methodical direct injections and insufflations. In such an event, as shown by the persistence of fœtor of the secretion, radical operation without removal of the ossicles is indicated. The latter procedure should never be attempted *via* the external auditory meatus, as it is dangerous and generally unnecessary.

Discussion of papers 1 and 2: THIES (Leipsic) advises the removal of the lateral wall of the attic with or without preservation of the ossicles and of the drum, depending on the extent and location of the purulent focus in cases of chronic suppuration of the middle ear involving the epitym-

panum and antrum which have not been cured by consistent and prolonged conservative treatment. Cases with external evidence of mastoid disease are excluded. The removal of the outer attic wall is performed according to Neumann (Vienna) under local anæsthesia *via* the external auditory canal. Diseased portions of the posterior canal wall may, of course, be removed if necessary, in case there is evidence of involvement of the antrum.

DENKER (Erlangen): Koerner's silence in regard to the dry treatment of chronic suppuration is tantamount to disapproval which indeed is deserved if one considers the unfavorable results. After syringing, the middle ear can best be cleansed by the air douche (Politzerization) drying with cotton on applicators to be introduced into the tympanic cavity and antrum and, finally, boric acid powder. Long years of experience have demonstrated that there is no danger of retention of secretion due to the boric acid powder caking into a large mass. Denker then opposes the thesis of the reviewer (Koerner) that involvement of the antrum may be excluded where we have destruction of Shrapnell's membrane only, with intact pars tensa.

POLITZER (Vienna): The limits of conservative treatment cannot be drawn in a hard and fast line, as external conditions and considerations play an important part. If the medication is to have any effect at all, the air douche (Politzer bag) must be used. Then it is necessary to apply suction *via* the external meatus. Peroxide has little effect in curing suppuration. The addition of alcohol is of benefit. Nitrate of silver forms large coagula and is not to be advised in case of small perforations. In any case it is better washed out with plain water than with salt solution. Rough spots are not to be smoothed with the burr. This instrument is dangerous as it slips easily and may cause damage to neighboring structures. Hartmann's canula is a valuable instrument but is not always sufficient. It is materially aided by the sharp spoon in case of immigration of epidermis.

HARTMANN (Berlin) considers the use of his middle-ear canula with a rubber bulb as not sufficient. A good hard rubber syringe is necessary. Perforation of the pars flaccida of the drum is particularly ominous, as indicated by Denker.

Passow (Berlin): Bier's congestive hyperæmia is of no value in chronic suppuration, but suction treatment is often followed by good results. The addition of formalin three or four drops to the half pint is warmly recommended.

Kuemmel (Heidelberg) calls attention to the value of instrumental dilatation of the Eustachian tubes with bougies in many cases of meso-tympanal suppuration.

Siebenmann (Basel) discusses the use of boric acid which he thinks has been rather unfairly treated in the reports of Koerner and of Scheibe. In irrigation treatment it is certainly to be preferred to toxic antiseptics, and it is of value in preventing decomposition in the middle-ear cavity, which, as we know, can never be kept quite dry.

Frey (Vienna): Alcohol treatment, as recommended by Politzer, contracts the blood-vessels. Adrenalin does the same thing, and the subsequent hyperæmia may have the same effect as Bier's treatment.

Ruttin (Vienna): Extraction of the incus and malleus is free from danger if it is preceded by a careful test of labyrinthine function. The pathologic anatomical findings show that not even all chronic suppurations of the mucous membrane can be cured by conservative treatment, to say nothing of the cases with bone involvement. Much may be accomplished by energetic application of caustics such as lysol, trichloracetic acid, and so on, after preliminary local anæsthesia, in suitable cases. There is always a possibility of pus foci escaping us if they are situated very deep or in some inaccessible corner. Such foci may be a source of imminent danger if they are situated near the sinus.

Bloch (Freiburg) strongly urges blowing out the middle-ear after syringing with the tympanic canula. He presents a modification of this instrument for the purpose indicated. He believes that it is impossible to carry a cotton applicator into the antrum, as claimed by Denker. If there is very little secretion in the antrum, treatment by the dry method is to be preferred.

Kretschmann (Magdeburg): Some suppurations run a protracted chronic course from the very beginning and arouse the suspicion of tuberculosis. They require constitutional treatment and a return to tuberculin therapy.

WANNER (Munich) advises elastic catheters for syringing, and insists on a sufficiently powerful stream of fluid. The conditions of distribution of fluid in the middle-ear during syringing can be demonstrated by a gross specimen with fenestræ. Subsequent careful drying with a soft probe is of importance.

HERZOG (Munich): Scheibe's indication for operation, depending on the cure or persistence of fœtor after continued treatment, is not the only one. As Politzer has pointed out there is a relative indication, based upon the social conditions of the patient. It should not be forgotten that boric acid treatment led Bezold to a discovery of the importance and significance of perforations in Shrapnell's membrane.

VOHSEN (Frankfurt): The addition of antiseptics and other chemicals to the irrigation fluid is of much less importance than the thorough and energetic mechanical cleansing. The trephine is to be avoided as dangerous, and weak perhydrol applied on cotton swab. Blowing out the ear may cause unpleasant symptoms, such as unconsciousness and is to be used only with great caution.

WOLF (Frankfurt) is in favor of treatment with alcohol, to which he sometimes adds resorcin or bichloride, and finds that it is of value even in acute cases.

Closing of *discussion*. SCHEIBE (Munich) would consider as a cure a cessation of suppuration for over a year. Later, relapses occur frequently, and in cholesteatoma they are invariable.

KOERNER (Rostock): There seems to be a general agreement on the main points of treatment. Thorough mechanical cleansing is the all-important point, and the middle-ear canula is a valuable aid. He has finally abandoned the burr, although it is by no means dangerous if used with caution and with foot power instead of being run by an electric motor. Boric acid in the hands of the surgeon is never dangerous if used appropriately, and general constitutional treatment must always be considered.

3. HEGENER (Heidelberg): **Measurement of high-pitched weak tones.** The method is intended to give a more delicate measure of rapid vibrations than is possible with Kundt's tubes and other appliances now in use. For this purpose it

is necessary to avoid the waste of power inherent in the use of a solid body as an indicator. Hegener uses a gas flame for this purpose. The apparatus consists of a Seebeck tube; the ear being replaced by a very sensitive gas flame under high pressure. By means of the resonance which results, the delicacy of this method surpasses even that of Lord Rayleigh, as the defects of the latter depending on the size of the flame and the heating of the air, are avoided. The accuracy is remarkable, and the method is an objective one in Melde's sense.

4. HEGENER (Heidelberg): **Suggestions for the determination of the upper tone limit.** The assumption of a physiological upper tone limit with 50,000 double vibrations, (Schwendt, Edelmann) is incorrect as Myers, Schulze, and the reader have shown the limit to be 20,000 d. v. The error is due to the fact that in blowing the Galton whistle by compressing a rubber bulb a series of tones is produced, the lowest of which lie several octaves below the ground tone of the whistle as determined with Kundt's tubes. These "edge tones" are responsible for the errors in determination of the upper tone limit. Blowing the whistle with constant pressure is open to the objections of marked practical difficulty, the disturbing feature of a blowing noise, and the possible deception by friction tones. Galton's whistle had better be given up. A better instrument seems to be offered in the monochord recently perfected by Schulze, in which the tone source is a single stretched string giving longitudinal vibrations. Tuning forks, or Meldes tuning plates may, if necessary, be used in addition.

Discussion of papers 3 and 4: SCHAEFER (Berlin): The intensity of tone of the monochord is not so much lower than that of other instruments, as to give a lower upper tone limit than is usually found, say, by means of the Galton whistle. Schulze has demonstrated this fact beyond a doubt.

BOENNINGHAUS (Breslau): Considering the limited number of fibres in Corti's organ, an upper tone limit of 20,000 d. v. is in better accord with the theory of Helmholtz than one of 50,000 d. v.

DENKER (Erlangen) calls attention to the comparatively small number of fibres in the organ of Corti of parrots, and

notes that the experiments would not prove the theory of Helmholtz.

SIEBENMANN (Basel) notes the correspondence of these results with those obtained by earlier investigators who experimented with vibrating rods.

In closing the discussion, HEGENER (Heidelberg) notes that there is an area near the upper tone limit in which there is no accurate sense of difference of pitch so that it is quite possible that the highest perceivable tones correspond to an area of fibres which is set in action by any one of them.

5. BÁRÁNY (Vienna): **Deafening alarm for the detection of unilateral deafness.** The sound ear is deafened by the noise caused by the apparatus in the external auditory canal, which consists of a membrane to be struck by a hammer run by clock work. The noise is conducted to the ear directly through a funnel. The hearing of the ear to be examined is not perceptibly affected. The apparatus is handy and portable. The noise is of even intensity. In cases of paracousis Willisii, application of the apparatus was followed by improvement of hearing lasting several days. Diagnosis and treatment of this affection may be facilitated by Bárány's instrument.

Discussion: Voss (Frankfurt) was able to produce a similar result and exclude one ear by compressing the air in the external auditory canal.

SCHEIBE (Munich) thinks the method a valuable one and that it promises good results in the examination of deaf mutes.

BÁRÁNY (Vienna) in closing the discussion answers a question of Boenninghaus, to the effect that hearing is somewhat affected on the side to be tested.

6. KARL L. SCHAEFER and H. SESSOUS (Berlin): **Significance of the middle-ear apparatus for audition, particularly of low-pitched tones.** The lower tone limit was determined by means of Edelmann's forks in thirty-four ears which had been subjected to the radical mastoid operation. With few exceptions it was found in the main octave or the octave below the staff. As it has previously been shown that after radical operation there is preservation of perception of medium, high, and highest tones, these investigations show on the whole that qualitative tone-perception is not affected

markedly by loss of the middle-ear apparatus. Quantitatively the disturbance is much more marked. This is a matter of common experience and is borne out by the careful investigations of F. Wagner. In the absence of the membrana tympani and the ossicular chain duration of tone perception is shortened in proportion to the lowness of the tone. The lower the tone, the shorter the duration of perception.

Discussion of 6: O. Wolf (Frankfurt) calls attention to the fact that as far back as 1870 he himself had tested the hearing for speech after removal of the ossicular chain, and had demonstrated the raising of the lower tone limit.

Boenninghaus (Breslau) notes that the amount of contractions of the lower tone limit depends on the degree of cicatricial stapes fixation or bony ankylosis, and vigorously opposes Bezold's assumption that the drum serves only to transmit low pitched tones.

Siebenmann (Basel) objects that Bezold's material was quite different from that studied by the writers of the paper (Schaefer and Sessous).

Herzog (Munich) points out that even Bezold, later on, as the tuning forks were improved more and more, found that the lower tone limit was lower than he had originally supposed.

Bloch (Freiburg) inquires whether over-tones of low pitched forks can be quenched by stroking, and whether the mobility of the stapes had been tested in the series of cases reported by Schaefer and Sessous.

Vohsen (Frankfurt) calls attention to an apparatus, which, it is claimed, allows the intensity of tones transmitted to the ear to be gradually and measurably diminished.

Scheibe (Munich) expresses his disapproval of this apparatus.

Wolf (Frankfurt) asks the general opinion as to the value of microphones as aids to hearing. Personally, he has found them useless.

In closing the discussion, Schaefer (Berlin) stated that over tones of tuning forks cannot be eliminated, while those due to jingling in consequence of irregular or violent striking can be done away with easily. The fundamental tones can be

intensified by resonators. Ankylosis of the stapes was not proven. The sound-conducting apparatus has its main function in the field of the lowest tones.

7. WANNER (Munich): **Functional tests in congenital syphilis.** Bezold was able to demonstrate congenital syphilis as a cause of acquired deaf-mutism in 5.6% of his cases; the impairment of hearing becoming manifest between the seventh and eighth or the eleventh and twelfth years. Wanner has followed 15 more cases carefully. In 5, mixed antisyphilitic treatment was used, with good results in 3. The fields of audition, presented by the reader, showed a picture of a sharply limited involvement of the inner ear. The female sex is predisposed in the proportion of 5:2. Diminution of hearing comes on rather suddenly. There is generally a history of previous keratitis, 2–4 years before and traces of corneal infiltration of a specific character can usually be seen. The keratitis may become active with the appearance of the ear disease. Hutchinson's teeth were present in half the cases. Tinnitus and vertigo were comparatively rare. The personal and family history is of the greatest importance in establishing the diagnosis and etiology.

The otoscopic picture is that of occlusion of the Eustachian tube, so that errors in diagnosis are easily made, especially if we fail to test carefully with the whispered voice. The words "four," "six," and "seven," are heard particularly badly. The lower tone limit is frequently raised; osseous conduction markedly shortened or abolished, with large defects at the upper tone limit, and positive Rinne. Qualitative defects, too, are not at all infrequent. The prognosis is doubtful, and therapeutic measures consist mainly in vigorous mixed treatment (inunctions and iodides). Unless some steps are taken to preserve it, speech is rapidly lost, even at the age of fifteen to eighteen. As long as a vocabulary is retained the children should be entered in the hearing classes of deaf-mute institutions as soon as possible.

Discussion of 7: BÁRÁNY (Vienna) has noted loss of response to stimuli in the vestibular apparatus in hereditary lues.

NADOLECZNY (Munich) has found almost exactly the same aural conditions as those reported by Wanner in the

children of a single family, where hereditary lues could not be made out beyond a doubt, and asks whether the vestibular apparatus responds to stimulation in cases where audition is still partially preserved.

HARTMANN (Berlin) notes that large doses of the iodides are well borne by children and are frequently very efficacious.

MUELLER (Heilbronn) reports one case in which local and general antiluetic treatment was used without effect.

MANN (Dresden) finds that the keratitis responds more promptly and satisfactorily to the antiluetic treatment than does the affection of the auditory nerve. In the latter, the positive results are very meagre.

EHRENFRIED (Kattowitz) claims that in these cases the iodides are more efficacious than inunctions.

WAGENHAEUSER (Tuebingen) has seen a large number of cases and finds the age limit very interesting. Two cases had passed the twentieth year. Keratitis had invariably preceded the aural affection. In but a single case was this relation reversed.

In closing the discussion, WANNER (Munich) corroborated the statement of Mueller and of Mann that the keratitis responds promptly to treatment while the acousticus affection is but slightly influenced.

8. DENKER (Erlangen): **Demonstration of three new ear-models.** These models were made at the request of the Bavarian Government by Bezold with the assistance of the sculptor, Hammer, of Munich, and have been placed in the new German Museum. In the first model, representing the entire organ of hearing, a vertical section from without inward shows the complicated form of the external auditory canal, and then turns and runs forwards and inwards along the axis of the Eustachian tube, leaving the drum intact. The entire middle-ear tract with the ossicles is clearly seen. The inner ear shows the cochlea laid open, in relation to the medial wall of the tympanic cavity, the vestibule, semicircular canals, and the internal auditory meatus with the acoustico-facial nerve. The second model is a corrosion specimen, magnified seven times, and giving an excellent

idea of the form and arrangement of all the pneumatic spaces of the organ of hearing.

The third model represents the tympanic cavity, highly magnified (20 times). It can be taken apart to show the relations of the various structures to the outer and inner wall of the middle-ear. Denker considers these models as valuable additions to the material for demonstration, especially for instruction in Universities.

9. SCHOENEMANN (Bern): **Demonstration of five built-up models of the human ear.** These models show an ear, magnified fifteen times, in flat sections which are assembled and can be taken apart to show the practically important structures in their natural relations.

10. POLITZER (Vienna): **The anatomical relations of the foot-plate stapes in otosclerosis.** Demonstration. (Microstereoscopic views.) P. demonstrates a number of histological specimens of cases of otosclerosis observed during life, in which the invasion of the stapes by the bone disease of the labyrinth capsule can be followed and studied in its successive stages. Many sections through the labyrinth capsule and stapes plate give the false impression that the otosclerotic process develops primarily in the latter. Serial sections of the same specimen, however, invariably prove a direct and immediate connection of the bone changes with those in the labyrinth capsule. It appears, further, that the otosclerotic process is not a mere metamorphosis of normal osseous tissue, but that we have to deal with a true neoplastic formation which displaces the normal bony tissue. This bony proliferation becomes particularly marked where it passes over to the foot plate, so that the latter is replaced by a bony structure often many times the original thickness, as shown clearly by the specimens. Other specimens show, as opposed to Habermann's view, that this is always due to a primary affection of the labyrinth capsule.

Discussion: BRUEHL (Berlin) demonstrates microscopic specimens in a case of chronic progressive hardness of hearing, that of a woman of sixty-three. The middle ear was normal except for fixation of the stapes by a focus of spongification in the wall of the promontory, with a second focus in the wall of the internal auditory canal.

11. Yoshii (Tokio) and Siebenmann (Basel): **Demonstration of experimental acoustic injuries of the ear.** (Microstereopticon.) The specimens were taken from guinea-pigs which had been subjected to various intense noises: 1. Whistles of various tone pitch. 2. Roll of a tin drum. 3. Explosions. The changes caused by the whistle were located in Corti's organ and the corresponding nerves and ganglion cells. The higher the note, the lower the situation of the lesion in the cochlea. A siren with a range of tone from f^3–f^4 causes changes throughout the entire extent of the membranous labyrinth, after a short application. The most extensive destruction was caused by explosions. A single shot with a toy pistol and cap may shatter the entire organ of Corti, and cause multiple varicosities of the nerve with degeneration of the ganglion cells, and some lesions of the vestibular apparatus.

Discussion: Marx (Heidelberg) reports on experimental injuries by noises. He used the capped pipes of Edelmann's series of 11,000 and 19,000 d. v. under constant pressure, measuring the number of vibrations by means of Kundt's tubes. In mice no marked lesions were found. Guinea-pigs showed some changes due to high tones, situated somewhat lower basalwards than those recorded by Wittmaack. Experiments intended to cause degenerative lesions of the vestibular apparatus by adequate stimuli, mechanical tossing and rotation, had only negative results.

Scheibe (Munich) notes that these animal experiments do not correspond in their results with experiences in human beings, as regards the effect of explosions.

Siebenmann (Basel) thinks the experiments do not allow us to generalize or to draw any broad conclusions for practical otology.

Hegener (Heidelberg) reports that in his own case, continued listening to high pitched whistle tones, 10,000 d. v. resulted in deafness for these tones, lasting thirty-six hours, and associated with high pitched tinnitus which, however, disappeared in time.

Koerner (Rostock) asks whether there was any lesion of the nerve terminals of the semicircular canals in these

experiments, as a negative finding would be valuable evidence against the views of Hensen.

SIEBENMANN (Basel) reported that varicose dilatation of the nerves appeared only after explosions.

DENKER (Erlangen) claims that the observations in cases of deaf-mutism speak against Hensen's hypotheses.

KOERNER (Rostock) thinks, that in spite of apparently contradictory results so far, a continuation of these experiments offers promise of added knowledge as to the functions of the inner ear.

12. SIEBENMANN (Basel) and YOSHII (Tokio): **Specimens of circumscribed labyrinthitis.** Demonstration. Micro-stereoscopic views. The cochlea of a guinea-pig was found to have a purulent focus at the base, and one at the apex, due to extensive middle-ear suppuration. The two middle turns were not affected.

Discussion of 12: WITTMAACK (Jena) called attention to the interesting phenomena presented by labyrinthine suppurations in animal experiment.

SIEBENMANN (Basel) calls attention to the possibility of artefacts in the microscopical specimens. If these are not hardened and fixed with extreme care and perfect technique severe lesions may be simulated.

13. ALT (Vienna): **Demonstration of microscopic specimens of labyrinthine suppuration and its sequelæ following epidemic cerebrospinal meningitis.** (Micro-stereopticon.) The first case was that of a boy of sixteen, who died only nine days after the first symptoms developed. The specimens show purulent interstitial neuritis of the cochlear, vestibular, and facial nerves, and fresh pus deposits in the cochlea, vestibule, semicircular canals, and inner wall of the tympanic cavity.

The second case was that of a young man of eighteen, who died on the sixty-seventh day of the disease, after having been under observation in the hospital for fifty-nine days. The specimens show the results of a turbulent labyrinthitis with almost complete destruction of the membranous structures and new-formation of vascular connective tissue with partial, and at some points complete, ossification of the cochlea, vestibule, and semicircular canals. The specimens in the third case, that of a laborer aged twenty-one years,

whose disease lasted sixty-one days, are characterized not so much by purulent infiltration, bony or connective-tissue proliferation in the labyrinth, as by complete destruction and fibrous degeneration of the nerve terminals of the entire labyrinth.

14. MARX (Heidelberg): **Lesions of the labyrinth due to radiant energy.** After a single exposure of the labyrinth of doves to radium, lasting one hour, labyrinthine symptoms came on after a period of latency of six months. Microscopic examination showed that they were due to degeneration of the sensory epithelium of the maculæ and cristæ acousticæ. No other lesions could be found. This observation may be of some therapeutic value in vestibular affections. In guinea-pigs, exposure of the cochlea to radium was followed by degeneration of Corti's organ. There was also an area of bony and connective-tissue degeneration and proliferation at the tip of the cochlea, but this was due to mechanical injury. Experiments with X-rays, which have not been concluded, have so far had no definite results.

15. RUTTIN (Vienna): **The question as to an ectasia of the cochlear duct.** Demonstrations of specimens, plates, and tables. We have to deal with a displacement of the membranous structures of the labyrinth which appears to be characteristic of an inflammation which slowly spreads through the labyrinth wall, "induced labyrinthitis." The ectasia affects the entire ductus cochlearis, although in the histological specimen it appears to be limited to the first half of the basal turn, as it is in this turn, alone, that Reissner's membrane is kept in its ectatic position by the exudate which settles along the inner side of the wall of the labyrinth and later becomes organized. In contrast to this "induced labyrinthitis," Ruttin found the membranous structures of the ductus cochlearis invariably destroyed in acute genuine labyrinthitis with an ascertainable port of entry of suppuration or evident perforation.

16. R. NAGER (Basel): **Demonstration of formation of labyrinthine sequestra in carcinoma of the middle ear.** (Stereopticon views of colored photographs, after Lumière.) In the case of a patient aged eighteen years, with a bad family history, an epithelioma developed on the site of an old middle-

ear suppuration with cholesteatoma which had been operated on in childhood. In spite of repeated attempts at extirpation, death took place in ten months. In the microscopic specimen a series of perforations was found in the vestibule, particularly at the orifices of the semicircular canals. There was an extensive fibrous and ossifying labyrinthitis, of a chronic type, in the cochlea. This is not characteristic of carcinoma, but must be considered as the residuum of an old labyrinthine inflammation which has run its course. Whether this took place in childhood or developed under the direct influence of the cancer, is an open question. The sequestrum was not completely necrotic, as shown by its vascularity and the fact that the cellular elements took the stains fairly well, but this observation shows that cancer, as well as tuberculosis or cholesteatoma may cause partial or total sequestration of the labyrinth. There is no similar case on record in literature.

17. FREY (Vienna): **Demonstration of microscopic specimens of developmental anomalies of the ear.** These specimens showed deformities in anencephalous monsters, and the question of their mode of origin was discussed.

18. DENKER (Erlangen): **Demonstration of a Bezold-Edelmann model of the tone-conducting mechanism of the ear.**

19. Voss (Frankfurt): **Clinical report on non-suppurative labyrinthitis in acute and chronic otitis media.** After an historical review of the arrangement of the affections of the inner ear in suppurative and non-suppurative groups, the writer presents his own observations on serous labyrinthitis, and draws the following conclusions:

1. The labyrinthine inflammation, occurring in the course of a genuine, *i. e.*, not scarlatinal or tuberculous, otitis media is generally serous, not purulent.

2. It may be circumscript, or diffuse.

3. A decision as to the localization and the area involved can be reached only after the most painstaking and thorough functional examination of the acoustic and static labyrinth.

4. The diagnostic differentiation of diffuse serous from diffuse purulent labyrinthitis in acute otitis media is facilitated by the almost simultaneous development of the former, with the causal suppuration in the middle ear, its rapid course, and favorable termination.

5. The circumscribed serous form differs from the purulent, also, in its early onset in otitis media, rapid course, and benign termination both in regard to disturbance of function and final cure. In circumscribed serous labyrinthitis the usual fistula symptom is absent.

6. As far as preservation or restitution of function is concerned the circumscribed form is the more benign of the two.

7. As to final recovery and cure, the two forms are on a par.

8. The healing of the inner ear affection generally keeps place with that of the otitis media.

9. Accordingly we must aim at a rapid cure of the middle-ear suppuration, if necessary by operative attack on a co-existing mastoiditis, to prevent lasting impairment of the delicate membranous and nervous structures of the inner ear.

10. The mastoid operation cannot be expected to correct functional disturbances due to diffuse serous labyrinthitis.

11. In connection with the radical mastoid operation, symptoms of labyrinthine irritation may develop which are not due to fistula or to operative traumatism (injury of the semicircular canals, dislocation of the stapes).

12. The cause of these irritative symptoms is probably to be found in operative manipulations of the labyrinth wall.

13. These symptoms are the expression of a serous infection of the labyrinth, probably by way of the membranes of the fenestræ.

14. The inflammatory processes in this case may be diffuse or circumscribed.

15. This point can be decided only by functional tests of the acoustic and static labyrinth.

16. These affections are distinguished from gross traumatic lesions of the labyrinth, in that they do not develop immediately after operation. Twelve to twenty-four hours usually elapse before they are noted. They do not reach a maximum until several days after operation, and generally subside more rapidly than the symptoms of labyrinthine injury.

17. They are differentiated from purulent infection by

the mode of onset just described, the absence of fistulous changes in the labyrinthine wall, the absence of fever, and the restoration of function on recovery.

18. The prognosis is favorable as to function and recovery.

19. Treatment is purely expectative.

Discussion of 19: SCHEIBE (Munich) thinks the term "labyrinthine irritation" or "paralabyrinthitis" should be applied to these cases. Those with limitation of hearing should be treated separately from the cases with deafness.

HERZOG (Munich): There is no histological proof of the lesions in Voss's cases. The results in tuberculosis are not analogous, as Hinsberg has shown. Blau's experiments with metallic plugging of the fenestræ may clear up the subject.

RUTTIN (Vienna) observed marked labyrinthitis which subsided later on, in cases of radical operation which were irrigated with 10% solutions of formalin.

In closing the discussion Voss (Frankfurt) considers the affection in these cases to have been true labyrinthitis, in all probability.

20. BLOCH (Freiburg): **Etiology of ankylosis of the stapes.** After a cursory review of the various theories as to the cause of hyperostosis of the labyrinth capsule, as this affection should really be designated, from a correct histological standpoint, Bloch reports a case which was clearly inherited. In a large family he was able to find 6 cases in two generations by means of careful functional tests. In one of these cases histological examination post-mortem verified the clinical diagnosis.

Discussion: SIEBENMANN (Basel): Heredity undoubtedly plays an important rôle, but the family history is often misleading or incomplete. Other evidence of degeneration may be found. The word sclerosis is much abused.

POLITZER (Vienna) thinks that the well-known and traditional word, otosclerosis should be retained, at least for typical forms.

21. MANASSE (Strassburg): **Exostoses of the porus acousticus internus.** Specimens in the case of a woman, aged eighty-three years. Two thick nodules were found at the upper margin of the left internal auditory meatus, and extending to the sinus. On the right side the nodule is more

prominent but does not extend so far laterally. The histological structure was that of an ivory exostosis with foci of spongy bone containing medullary spaces. Tympanum, meatus, and labyrinth were free.

22. E. RUTTIN (Vienna): **Surgery of the temporal bone.** Demonstration. In a case of subacute purulent otitis with labyrinthine fistula and deep extradural abscess, Ruttin was obliged to extirpate the entire petrous portion in order to insure removal of all diseased tissue. The danger of hemorrhage, cerebral traumatism, and meningitis, is not imminent, and should not deter us. Aural surgery must not halt at the carotid canal. Ruttin notes that Bárány has recommended a similar procedure for removal of tumors of the auditory nerve, and has practised it on the cadaver.

Discussion: BÁRÁNY (Vienna): This case shows that removal of the pyramid is feasible, and he has recommended it, in place of the usual procedure for the extirpation of acousticus tumors. Tests of the vestibular function are decisive in these cases.

KUEMMEL (Heidelberg) advises the publication of this method in the surgical journals.

23. ALT (Vienna): **Operative treatment of otogenous facial paralysis.** The paralyzed facial nerve is marked by its extraordinary powers of regeneration. We see paralyses which have developed in the course of a chronic middle-ear suppuration, or after a radical mastoid operation, and which clear up after a year or even more. There is, however, a small number of cases which persist in spite of the most careful conservative treatment. To restore the function of the paralyzed nerve in these cases, anastomosis of the facial with the hypoglossus or accessorius is advised. Alt has had a successful case of this sort. The nerve grafting can be considered by otologists only in those cases in which a large labyrinthine sequestrum has been removed with the greater part of the Fallopian canal in the course of a radical mastoid operation. In other cases we have much simpler methods at our disposal, which can be applied without injuring any other cranial nerves. In patients with old otitis media and facial paralysis of long standing Alt performs the radical operation in the following manner:

Careful hemostasis is applied to give a clear field. After clearing out the antrum and tympanic cavity, adrenalin is used freely, the Fallopian canal exposed to discover any necrotic areas in the bony wall, and the facial canal opened, centrally and peripherally from the solid angle. The canal is cleaned and the nerve freed from granulations or cholesteatomatous masses, and laid back in its opened bed. He observes a similar procedure in cases of post-operative facial paralysis which have lasted more than six months and which show no return of function and of electrical reaction, in spite of the usual measures. Instance of a cure by this procedure in a case of four years' standing was reported. The facial was exposed in the horizontal and vertical portion of the Fallopian canal for quite a distance. There was no actual loss of continuity at any point, but in the horizontal portion the nerve was imbedded in dense connective tissue instead of lying free in the bony canal. Alt was loath to believe that the imbedding in scar tissue alone was a sufficient cause of the paralysis, but that this was actually the case was shown beyond a doubt by the subsequent course of the case which went on to rapid and complete recovery.

Discussion of 23: Uffenorde (Goettingen): has described the technique of exposure of the facial nerve for the purpose of operative treatment of labyrinthine suppuration. He doubts the possibility of recovery in facial paralysis of five to six months' standing.

Alt (Vienna): Not all cases of facial paralysis are curable by this operation, but a certain number will undoubtedly recover which would otherwise be lost, as spontaneous cure is unusual.

Passow (Berlin) observed recovery from facial paralysis, after secondary operation. The original operation had been performed ten years previously.

24. Lindt (Bern): **Case of rare localization of tuberculosis in the nose.** Case of a young man who had had an initial syphilitic lesion four years previously, had been treated thoroughly, and pronounced cured. In the posterior third of the right lower meatus, on the wall of the antrum, and extending to the lower turbinate, a dense soft nodule developed in the mucous membrane, looking very much like

an ordinary granulation tumor This spread, leading to a defect of the antrum wall, without sequestration, fœtor, or inflammation in the neighboring tissues. Iodides were not tolerated, and had no influence on the growth which was radically cured by excision. Microscopic examination showed granulation tissue with unmistakable evidence of tuberculosis; non-vascular round foci of epithelioid cells with typical giant cells, but no syphilitic vessel changes. The patient had slight dulness at the apex, and gave a positive reaction to the cutaneous tuberculin test. The infection was probably hematogenous or lymphogenous. The case is interesting on account of the unusual localization of the tubercular focus in the nasal mucosa, and the previous luetic infection of the patient.

25. MARX (Heidelberg): **Demonstration of osteomata of accessory sinuses.** 1. Sphenoidal sinus osteoma in a man of thirty-five years. Exophthalmos of four years' standing. Sudden development of orbital cellulitis and high fever. Operation, three days later. Removal of a tumor *7cm* long which almost completely filled the orbit. The eye was preserved. Uneventful recovery. Temporal half of visual field contracted, probably by traction on the globe during operation. Vision somewhat better than before operation ($\frac{1}{3}$). Motility good. No spontaneous diplopia. Satisfactory cosmetic result.

2. Osteoma of the frontal sinus in a woman of twenty-eight. Protrusion of the eye gradually increasing, since ten years. Some days before operation marked emphysema of the conjunctiva developed after an attack of sneezing. A nodular tumor, *3.5cm* large, was removed, which was attached to the floor of the frontal sinus. Subsequent course and cosmetic result good. No ocular traumatism. No diplopia.

3. Osteoma of the ethmoid sinus in a man of eighteen years. Typical case. Large dense sclerosed tumor, *3cm* large, springing from the anterior ethmoidal cells. Operative removal. Uneventful recovery.

Discussion of 25: MOELLER (Hamburg): Report of a case of ethmoidal osteoma in a patient twenty-six years of age. Diagnosticated in 1899 by Thost (Hamburg). An attempt

at removal by the intranasal method failed. In 1903 an ivory exostosis the size of a walnut was removed at Kiel. In 1907, Kuemmel (Hamburg) operated again, removing a tumor larger than a walnut from the anterior ethmoidal cells, after making an osteoplastic flap and turning down the hard palate. Three months later, a second growth was removed by Thost (Hamburg) by the intranasal route. Since then there has been no recurrence.

KILLIAN (Freiburg) reports having observed a freely movable osteoma of the nose in a female patient.

26. UFFENORDE (Goettingen): **Two cases of subdural abscess.** Demonstration of macroscopic and microscopic specimens. 1. Case of cured subdural abscess of the middle fossa, complicated with extradural and left temporosphenoidal lobe abscess. The brain abscess was at a distance from the purulent focus in the middle-ear. The pathogenic micro-organism was found to be a facultatively anaërobic saprophyte, recognizable by marked fœtor and a marginal zone of marked encephalitis with purulent infiltration. In the after-treatment Uffenorde advises angular glass drains containing a strip of gauze. Persistent aphasia was the only symptom in this case.

2. Almost purely subdural suppuration. Only the part located above the tegmen could be evacuated by crucial incision. Typical symptoms were absent in both cases.

The histological findings were identical in both cases: marked yellowish discoloration of the otherwise smooth, unperforated dura which was surrounded by granulations. The arachnoid was preserved. At post-mortem a second large uncomplicated focus was discovered over the occipital lobe. It was caused by the streptococcus mucosus. Death was due to leptomeningitis.

27. MUELLER (Heilbronn): **Wound retractor for mastoid operations.** Double hook with spring and adjustable claws.

28. HARTMANN (Berlin): **Closure of retro-auricular openings by reclination of the concha.** In the course of operative procedures which lead to the formation of persistent retro-auricular openings, the concha is displaced forwards and outwards. The fistula is located on the exposed surface of the mastoid process which was formerly covered by the

ear. In order to close the opening, the concha must be replaced backward. This is most easily accomplished by excising the scar tissue so as to form a vertical oval with pointed ends, with the fistula at the middle-ear. The upper and lower end of the oval must extend beyond the point of attachment of the level of the auricle, and the anterior and posterior wound margins must be equally distant from the edge of the retro-auricular opening. The edges of the oval wound are then united by sutures. In this way free access is gained to the tympanic cavity, and the disfigurement completely removed.

29. Voss (Frankfurt): **Demonstration of a salpingoscope with attachment for catheter and bougie.** In order to pass a Eustachian catheter or bougie under the guidance of the eye, Voss has modified the salpingoscope of Valentin, which is similar in construction to the cystoscope as arranged for ureteral catheterization. With this instrument a catheter can be introduced into the Eustachian tube and turned in any direction under visual control.

30. KRETSCHMANN (Magdeburg): **Operative treatment of deformities of the nasal septum.** Demonstration of model. The upper lip is turned backward and an incision carried along the line of attachment to the gum from one canine tooth to the other, down to the bone. The upper wound margin is detached from the bone and pushed upward with an elevator, until the lower edge of the piriform aperture appears. The margin of the aperture is then circumcised with a raspatory and the mucous membrane of the floor of the nose and of the septum detached on both sides. The detached mucosa is held out of the way with blunt retractors. The septum is now in full view, bared to the bone, and any procedures necessary can be carried out. The soft parts are then replaced. The flap wound does not need to be sutured. There are generally some fever and œdema of the face in the days immediately following operation. The operation allows inspection and gives plenty of room. The anterior nasal spine and the crista incisiva are often found to be thickened by exostosis and may have to be corrected. The floor of the nose may have to be chiselled down.

31. UFFENORDE (Goettingen): **Pathologic and bacterio-**

logic findings in a case of extensive parietal thrombus of the sinus. Demonstration. Case of purely parietal thrombus of the sigmoid sinus which extended by inflammation of the sinus wall peripherally to the longitudinal and transverse sinuses, and centrally to the internal jugular. The thrombus was so smooth and tough that at the first operation it was mistaken for the inflamed inner wall of the sinus and was not disturbed. The presence of pulmonary metastases was masked for a time by an existing bronchial catarrh of long standing. Chills and bloody sputa led to a correct diagnosis. In the course of several operations the jugular bulb was completely exposed, after Grunert, but more metastases occurred, probably by way of the transverse sinus of the other side. In the jugular bulb operation the field was obscured by free bleeding from a posterior condyloid emissary vein.

The parietal thrombus was rough and nodular. Histological specimens of the vein and the jugular thrombus were presented.

Uffenorde then discussed the pathogenesis of general sepsis on the basis of his clinical experience, the literature, and animal experimentation. He distinguishes four forms:

1. Obstructing thrombus, generally found in acute infection of great virulence.

2. Necrosis of the wall, allowing entrance of large numbers of micro-organisms into the general circulation from the neighboring pus focus.

3. Parietal thrombosis in case of lower virulence, or in chronic cases. In the presence of virulent germs the same kind of thrombus may be caused by reactive inflammation forming a protective wall in the sinus.

4. Direct entrance of germs into the blood without any thrombo-phlebitic process.

Discussion.—RUTTIN (Vienna) believes that Uffenorde's surgical procedures must infallibly lead to general sepsis.

Voss (Frankfurt) claims that the operative course in this case shows the superiority of his procedure over that of Grunert.

UFFENORDE (Goettingen) thinks that the general infection in this case was not to be wondered at, but that the surgical

procedure used was the only one available. Operation by Voss's method would hardly have had any different result.

32. E. URBANTSCHITSCH (Vienna): **Galvanic treatment of the ear.** Demonstration of auditory curves and of an apparatus for auto-therapy. Persistent application in repeated sessions of long-continued currents of low intensity, after the method of Urbantschitsch, senior. This is facilitated by an apparatus which allows the patients to apply treatment themselves. Good results as to tinnitus and hearing.

33. HERSCHEL (Halle): **X-ray examination in decalcification of temporal bones.** Roentgen rays will show the slightest trace of lime salts, and are a valuable aid to determine when decalcification of specimens is complete.

34. HEGENER (Heidelberg): **Thin celloidin sections through the temporal bone.** Demonstration. In order to get sections 10 μ thick through hard bone it is necessary to immerse the specimens in very thin celloidin for a long time, in vacuo, to have a rigid specimen and knife (Jung microtome) and to moisten with alcohol having an alkaline reaction. Various details in regard to the temper of the microtome blade, the form of the block, and the direction of sections, were then given. These thin sections are of use in neurological investigations and for the purposes of micro-photography.

REPORT ON THE PROGRESS IN OTOLOGY AND RHINOLOGY DURING THE THIRD AND FOURTH QUARTERS OF 1907.

By Prof. ARTHUR HARTMANN, Berlin.

Translated by Dr. Arnold Knapp.

ANATOMY AND PHYSIOLOGY.

627. Bielschowsky and Brühl. **On nerve terminations in the membranous labyrinth of vertebrates.** *Arch. f. mikr. Anat.*, vol. lxxi.

628. Jürgens. **The sigmoid sinus in children one and two years of age.** *Monatsschr. f. Ohrenhlk.*, 1907, Pt. 8, p. 437.

629. Habermann. **On changes of the ear in hemicephalia.** *Festschr. f. Prof. Dr. Hans Chiari.*

630. Lapyre. **Osseous bullæ at the head of the middle turbinate.** *Thèse de Paris.*

631. Schoenemann. **On the physiology of normal and hyperplastic tonsils.** *Monatsschr. f. Ohrenhlk.*, 1907, p. 179.

627. Bielschowsky and Brühl. *On nerve terminations in the membranous labyrinth of vertebrates.*

These authors have examined the membranous labyrinth in guinea-pigs, monkeys, and human embryos by Bielschowsky's fibrillary method. The previously learned facts concerning the nerve terminations in the labyrinth can be demonstrated with remarkable clearness by this method. A number of new conditions were found which will have to be read in the original. Brühl.

628. Jürgens. *The sigmoid sinus in children one and two years of age.*

Anatomic observations on the configuration of the sigmoid sinus in young children. Wittmaack.

629. HABERMANN. *On changes of the ear in hemicephalia.*

Reports on changes in the ear in anencephalia and hemicephalia are rare. There are only two reports of microscopic examination of the organs of hearing in anencephalia. Habermann had the opportunity of examining the ear in two cases of hemicephalia. The work is characteristic of the careful research of the author. Owing to the non-development of the brain and changes in the form and development of the base of the skull, the development of the internal ear is retarded, partly by pressure and partly by deviation of the position of various parts, causing marked changes in the internal ear. RÖPKE.

630. LAPYRE. *Osseous bullæ at the head of the middle turbinate.*

This dissertation gives a complete review of bone blisters of the middle turbinate. OPPIKOFER.

631. SCHOENEMANN. *On the physiology of normal and hyperplastic tonsils.*

The author opposes Brieger's "protective theory" on the part of the tonsil. He regards the view of the secretory function of the tonsil and its hyperplasia as most improbable. The main function of the tonsil is rather due to the internal cellular activity of the adenoid tissue. The tonsils are to be regarded as subepithelially displaced cervical lymph nodes. The permanent hyperplasia of these organs is a pathological condition which should be operated upon in cases in which the neighboring organs are interfered with. WITTMAACK.

GENERAL.

a.—REPORTS.

632. BURKNER and UFFENORDE. **Report of cases in the University polyclinic of Göttingen for diseases of the nose and ear in the years 1905 and 1906.** *Arch. f. Ohrenhlk.*, vol. lxxii., pp. 50–76.

633. DALLMANN and ISEMER. **Yearly report on the Halle ear clinic., from April 1, 1906, to March 31, 1907.** *Arch. f. Ohrenhlk.*, vol. lxii., pp. 161–204.

634. SCHWARTZE. **Review of the development of the University ear clinic of Halle with statistics of cases and number of students from 1863 to 1907.** *Arch. f. Ohrenhlk.*, vol. lxxii., pp. 11–29.

635. FEER. **Influence of consanguinity of parents on the children.** *Jahrbuch der Kinderhlk.*, vol. lxvi., Pt. 2.

636. URBANTSCHITSCH. **On the relation of naso-pharyngeal lesions to deafmutism.** *Monatsschr. f. Ohrenhlk.*, 1907, Pt. 3, p. 115.

632. BURKNER and UFFENORDE. *Report of cases in the Göttingen clinic for diseases of the nose and ear.*

Statistics are given as to the number of cases treated (4638) with details as to age, sex, disease, and operation. Four interesting case histories are described: acute osteomyelitis of the zygoma; infection of the exposed sinus wall, extradural abscess of the cerebellum; plastic covering of bony defects; orbital complications of superior maxillary suppuration, together with three deaths. Bier's hyperemia treatment has given only apparent results and is not favored by the authors because of its possible danger. For the production of analgesia of the nasal mucous membrane a 5% solution of alypin in 1:1000 paranephrin is suggested.

ZARNIKO.

633. DALLMAN and ISEMER. *Yearly report on the Halle ear clinic.*

The number of dispensary patients has risen to 3282. In addition to statistic data there is one case history: extensive cholesteatoma with sinus thrombosis; removal of polypi from the meatus, radical mastoid operation, ligation of the jugular vein, operation on the sinus, operation on the jugular bulb with injury to the vagus; recovery. There are some remarks on three other interesting cases—rupture of the drum membrane from a box on the ear, pyæmia, recovery; two cases of otitic temporal lobe abscess. Report on ten deaths during the year.

ZARNIKO.

634. SCHWARTZE. *Review of the development of the University ear clinic of Halle with statistics of cases and number of students from 1863 to 1907.*

The growth of this clinic is given in the classical language of the authors. The clinic began as an annex with 145 patients; in 1896–7 there were 318 indoor and 3282 dispensary patients. During the year of the report there were 246 fatal cases, of which 191 were due to ear diseases. Most of the fatal cases were due to intracranial complications

following otitis. From April 1, 1884, to April 1, 1907, 2314 operations on the mastoid were performed. During the last ten years there were 481 simple and 960 radical mastoid operations performed. A list of the assistants who have been active in the clinic is given. The number of students who have attended the courses, as well as a complete chronological list of all of the literary publications of the directors and students, end the paper. ZARNIKO.

635. FEER. *Influence of consanguinity of parents on the children.*

The relationship of consanguinity of the parents to the children is studied with reference to mental diseases, idiocy, retinitis pigmentosa, and deafmutism. The author concludes that certain morbid predispositions such as retinitis pigmentosa and congenital deafmutism acquire increased hereditary tendency if they are present in the family of both parents. HARTMANN.

636. URBANTSCHITSCH. *On the relation of naso-pharyngeal lesions to deafmutism.*

The author finds that most deafmutes suffer from chronic catarrhal middle-ear processes, that many of them show chronic pharyngitis, and that there is generally a tendency to hyperplasia of the lymphatic tissue of the naso-pharynx. In none of the cases operated upon for adenoids was the deafmutism improved; nevertheless, the general condition and the catarrh of the nose and the nasopharynx were favorably influenced. WITTMAACK.

b.—GENERAL PATHOLOGY AND THERAPEUTICS.

637. BLEGVAD. **On the action of the use of the telephone on the body in general, with especial reference to the ear.** *Arch. f. Ohrenhlk.*, vol. lxxi., pp. 111–117, 205–237; vol. lxxii., pp. 30–50, 205–252.

638. BEZOLD. **The escape of the labyrinth water and its effect on the function of the ear.** *Zeitschrift f. Biologie*, vol. xlviii.

639. PASQUIER. **Traumatism of the ear during manual labor.** *Thèse de Paris*, 1906.

640. JÜRGENS. **Affections of the ear, nose, and throat following the explosion of bombs and firearms.** (Continuation and conclusion.) *La presse otolaryn.*, 1907, Pt. 10.

641. FREY. **The so-called reflex epilepsy following disease of the ear and nasopharynx.** *Wiener med. Presse*, No. 28, 1907.

642. STEIN. **A case of extremely slow respiration of nasal origin.** *Russische Monatsschr. f. Ohrenhlk., etc.*, October, 1907.

643. SCHAPIRO. **On the influence of difficult nasal respiration on the morphological condition of the blood, respiration, and circulation.** *Dissertation Moskau*, 1907.

637. BLEGVAD. *On the action of the use of the telephone on the body in general, with especial reference to the ear.*

This extensive paper begins with a critical review of everything which has been published on the subject. The author's investigations consisted in the examination of 450 telephone operators. In all of those examined, not only was the condition of the ears carefully noted, but especial attention was paid to nervous and other general disturbances which might be referable to the use of the telephone. In 26.4% of the 371 telephone operators with normal hearing, a retraction of the drum was found on the side used in telephoning; the other ear was usually normal. It seems, therefore, quite probable that this anomaly was directly or indirectly caused by the use of the telephone. The use of the telephone as a profession does not cause a diminution of hearing in individuals with normal hearing, nor, on the other hand, is there any proof that acuity of hearing is increased thereby as is often believed by telephone operators. It is probable that in the course of time the ear becomes accustomed to the use of the telephone and the transmitted voice is better perceived. It is not proven that the regular use of the telephone exerts an unfavorable influence on ear disease, although there are instances where lightning, or very sudden loud noises during the use of the telephone, have aggravated ear disease, or have caused it. It is therefore advisable that only individuals with normal ears be employed for telephoning. In a few cases, and generally in individuals nervously disposed, the use of the telephone has caused headache and subjective ear disturbances, as pain, tinnitus, pressure, feeling of fulness in the head, hyperesthesia acoustica. Some of these symptoms have their origin in general nervousness which is brought about by the usual conditions of this pursuit. Anæmic, nervously disposed persons should not be employed. Severe disturbances to the ear from lightning or short circuit have not been observed by the author up to the present time.

Some harmful results have followed the use of the so-called "head-telephone"—acne of the external ear, itching of the ear, eczema, otomycosis, etc. The head-telephone, moreover, cannot be removed as quickly as the hand-telephone in the event of sudden, unexpected loud noises, and is, therefore, more dangerous. ZARNIKO.

638. BEZOLD. *The escape of the labyrinth water and its effect on the function of the ear.*

In the introduction Bezold gives a review of the present status of the functional examination of the human ear. He regrets that in the reports of cases of operative opening of the labyrinth, the condition of the hearing before and after the operation is so briefly and incompletely given; at the same time the author acknowledges that in many of these cases the results of examination are not suited for physiological deductions on the hearing function. Even in uncomplicated puncture injuries of the labyrinth, no definite deductions can be given as to the rôle of the labyrinth water in sound transmission. The author cites a case in point. On very careful and exact functional examination he decides that the release of the endolymphatic spaces, through the escape of the perilymph at Corti's organ, is not functionally injurious in its action. The very interesting results of his examination should be read in the original. RÖPKE.

639. PASQUIER. *Traumatism of the ear during manual labor.*

Under the guidance of Castex this dissertation treats of the injuries of the external, middle, and internal ear. Not all of the 40 case histories prove that the changes in the drum and the reduction in hearing were actually the result of trauma. It is not stated how important it is that these accident cases should be immediately examined by a specialist and not only after waiting weeks or months.

OPPIKOFER.

640. JÜRGENS. *Affections of the ear, nose, and throat following the explosion of bombs and firearms.*

Group II. treats of 4 cases of injuries of the ear and mastoid process with firearms. In the first 3 cases the wounds healed without changes in the mastoid process, while in the fourth

there is a large hematoma in the bone which prevents the formation of granulations. The tolerance of the tissues of the skull and of the neck to relatively large bullets is remarked. Group III. represents injuries of the superior maxillary by firearms, which heal readily. Group IV.—injury of the larynx with firearms; paralysis of the recurrent nerve.

BRANDT.

641. FREY. *The so-called reflex epilepsy following disease of the ear and nasopharynx.*

The author endorses Binswanger's definition of reflex epilepsy. There then follows a consideration of a number of cases in the literature. Of 112 cases which the author examined, 16 were true cases; of these, 4 were treated with positive results. The author also made animal experiments on guinea-pigs which had been rendered epileptic according to the Braun-Sequard method by the enclosure of various foreign bodies in the ear and nasopharynx, also other irritations, and found that they resulted positively. This form of irritation has, so to speak, the same epileptic action as external trigeminal irritations. In view of their clinical observations and experiments, the authors conclude that children and individuals who through infantile cerebral disease, chronic toxemia, injuries to the head, or other injuries, have a predisposition toward epilepsy, are rendered more prone to epileptic attacks by diseases and foreign bodies in the ear, nose, and throat than by other peripheral irritants.

WANNER.

642. STEIN. *A case of extremely slow respiration of nasal origin.*

A girl, eleven years of age, with pronounced hypertrophic rhinitis and adenoid vegetations which occluded the choanæ to one third of their extent. A year and a half ago the child suffered from sighing which gradually increased. The number of individual sighs was five to the minute. After each excitement the sighing became more frequent and was followed by a cessation of respiration with threatened asphyxia. Ordinary respiration of the child required the aid of all the accessory muscles. The tip of the nose became cyanotic. During sleep the deep sighing ceased, but on awakening the

respiration became slow and gradually the sighing began. After removal of the adenoids and relief of the hypertrophy of the inferior turbinate, breathing became normal.

SACHER.

643. SCHAPIRO. *On the influence of difficult nasal respiration on the morphological condition of the blood, respiration, and circulation.*

The examination of the blood in 130 children from three to seventeen years old, suffering from adenoids, showed that in those suffering from difficult nasal breathing the number of red blood corpuscles was diminished, while the leucocytes were increased. Of the cases operated upon in 57 the blood was again examined one month after operation, and it was found that the number of red blood corpuscles was not greatly influenced. The number of leucocytes diminished one month after operation. Experiments on dogs showed:

1. After complete occlusion of the nose in young dogs for some time, the autopsy revealed pronounced emphysema.
2. After complete closure of the nose in young dogs the red blood corpuscles, leucocytes, and hemoglobin were increased.
3. After packing the nose in dogs the number of respirations becomes less frequent, the excursions of the thorax greater, the diaphragm sinks, and the pressure in the trachea becomes greater.
4. After complete occlusion of the nose in dogs the pressure in the arteries and peripheral veins is increased, while the pressure in the right ventricle is decreased.
5. Unilateral occlusion of the nose has no influence on the circulation or respiration.
6. All of these symptoms can be explained by the insufficient admission of air to the lungs.

SACHER.

c.—METHODS OF EXAMINATION AND TREATMENT.

644. DOLGER. **How is it possible to make a diagnosis of simulation in the functional examination, and how can we obtain the best idea of the amount of hearing present?** *Münch. med. Wochenschr.*, 1907, No. 31.

645. BÜRKNER. **On alypin in otology.** *Berlin klin. Wochenschr.*, No. 14, 1907.

646. HARTMANN. **The use of perborate of sodium in the treatment of the ear, nose, and throat.** *Deutsche med. Wochenschr.*, No. 38, 1907.

647. LEUTERT. **Bier's congestion treatment in otology.** *Deutsche med. Wochenschr.*, No. 31, 1907.

644. DOLGER. *How is it possible to make a diagnosis of simulation in the functional examination, and how can we obtain the best idea of the amount of hearing present?*

Dolger emphatically states that the functional examination is the best means for unmasking the simulation, and gives tests which must be read in the original. In the examination with speech it must be remembered that the simulator will often make the appropriate lip movements. On giving two numbers the simulator will often repeat only one, while the confounding of numbers which is characteristic of the deaf never occurs. To obtain an idea of the amount of hearing present the author suggests examining with the face turned alternately away from and towards the patient.

SCHEIBE.

645. BÜRKNER. *On alypin in otology.*

Bürkner has used alypin anæsthesia in paracentesis, incision of furuncles, and minor operations in the tympanic cavity with satisfaction. MÜLLER.

646. HARTMANN. *The use of perborate of sodium in the treatment of ear, nose, and throat.*

Instead of Bezold's boric acid, Hartmann has used perborate of sodium which is put up by Merck of Darmstadt. This sodium preparation works excellently in all catarrhal, suppurative, and ulcerative diseases of the mucous membrane in the ear and upper respiratory passages. Its use is practically always painless although in laryngeal tuberculosis it may irritate if used in too large quantities. According to Hartmann the disinfecting action of this remedy is due to the peroxide of hydrogen, and culture experiments by Dr. Topfer have shown that the perborate powder will retard the development of staphylococci and typhoid bacilli. A new powder blower is also described. NOLTENIUS.

647. LEUTERT. *Bier's congestion treatment in otology.* The author bases his remarks on the papers which have appeared on this subject and concludes as follows:

1. Congestion treatment is useless in chronic middle-ear suppuration, but may be indicated in certain acute forms of mastoid suppuration.

2. Congestion before the evacuation of pus from the mastoid process is dangerous for the sinus and should only be employed when the patient is under close observation in a hospital.

3. In the severe forms of otitis which follow scarlet fever and measles congestion should be employed with caution.

4. Recent cases are only adapted to test the treatment if without the use of congestion they would presumably have led to operation in a few days.

5. The previously accepted treatment—in the beginning of the disease to lessen the fever and relieve the pain by paracentesis—cannot be replaced by congestion hyperemia.

NOLTENIUS.

EXTERNAL EAR.

648. FALLAS. **Keloid of the lobe of the ear.** *La presse otolaryn.*, 1907, Pt. 9.

649. UFFENORDE. **On plastic operation for deformities of the auricle. Report of a useful method in cases of microtia.** *Münch. med. Wochenschr.*, 1907, No. 43.

650. BAUROWICZ. **Keratosis obturans.** *Monatsschr. f. Ohrenhlk.*, 1907, Pt. 7, p. 395.

651. TROFIMOW. **The surgical treatment of adhesions in the external auditory canal.** *Russische Monatsschr. f. Ohrenhlk.*, July, 1907.

652. BALL, BARRY J. **Pulsating growth in the left external auditory meatus.** *Proceedings of the Royal Society of Medicine, Otolog. Sec.*, vol. i., No. 5, 1908, p. 32.

653. LYDSTON, G. F. **Case of pugilist's ear.** *Surg. Gynecol. and Obstet.*, October, 1907.

648. FALLAS. *Keloid of the lobe of the ear.* Following perforation of the lobule in a little girl, small round tumors developed around the aperture making the wearing of earrings impossible. Treatment by thiosinamine was without any result. BRANDT.

649. UFFENORDE. *On plastic operation for deformities of the auricle. Report of a useful method in cases of microtia.*

Report of a bilateral operated case. The method must be read in the original. SCHEIBE.

650. BAUROWICZ. *Keratosis obturans.*

The disease described by the author as keratosis obturans is that which is generally known as cholesteatoma of the external auditory canal or epidermis plug.

WITTMAACK.

651. TROFIMOW. *The surgical treatment of adhesions in the external auditory canal.*

The author finds that the crucial incision is indicated only in membranous occlusion in the cartilaginous or bony parts of the auditory canal, if it does not measure more than 3*mm*. In fibrous occlusion of the cartilaginous portion the best method consists in dilatation of the bony canal according to the type of radical trepanning, removal of the cicatrix from the posterior wall, and suture of the remaining flap posteriorly. In congenital atresia operative treatment is without value.

SACHER.

652. BALL, BARRY J. *Pulsating growth in the left external auditory meatus.*

A reddish, pulsating growth, which had first been noticed ten years previously, had been gradually increasing in size until it filled the meatus and protruded slightly from the orifice. The pulsation was communicated to the auricle and region in front of it. The attachment was deep within the meatus and could not be made out as manipulations caused hemorrhage. The growth was presumably angeiomatous in nature. No operative treatment was advised.

HUNTER TOD.

653. LYDSTON, G. F. *Case of pugilist's ear.*

The auricle was found to be greatly distorted and thickened, the concha and auditory meatus being filled with cartilaginous tumors almost of the density of bone. The average thickness of the auricle was over three-quarters of an inch. Subcutaneous resections of the cartilaginous over-growth,

with due regard to the normal anatomical configuration of the auricle, brought about a most satisfactory result.

CLEMENS.

MIDDLE EAR.

a.—ACUTE OTITIS.

654. BLUM. **Otitis media in children. New and practical point in diagnosis; bacterial investigations.** *California State Med. Jour.*, October, 1907.

655. HOLMES, C. R. **Hysteria of the ear.** *Laryngoscope*, August, 1907.

656. KERRISON, P. D. **The Eustachian tubes in infants and young children; anatomic differences as compared with the adult type; bearing upon tympanic disease.** *Laryngoscope*, September, 1907.

657. SHEPPEGRELL. **Prevention of deafness.** *N. Y. Med. Jour.*, September 7, 1907.

658. KYLE, JNO. J. **Report of a case of acute suppuration of the middle ear, mastoid process, and labyrinth, due to Klebs-Loeffler bacillus.** *Indiana Med. Jour.*, September, 1907.

659. REINHARD. **Case of gonococcic otitis.** *Monatsschr. f. Ohrenhlk.*, 1907, p. 436.

660. MÖLLER. **Otitic osteomyelitis of the level cranial bones.** *Hospitalstidende*, No. 50, 1907.

661. GORDING. **Mastoid resection in displaced sigmoid sinus.** *Norsk mag. f. lag.*, 1907, p. 1285.

662. MOSKALEW, M., and TROFIMOW. **The etiology of suppuration of the mastoid process and its clinical appearances.** *Russische Monatsschr. f. Ohrenheilk, etc.*, August, 1907.

663. BAILLEZ. **Dental pain consecutive to lesion of the facial nerve after mastoid operation.** *La presse otolaryngol.*, 1907, Pt. 10.

654. BLUM, S. *Otitis media in children. New and practical point in diagnosis; bacterial investigations.*

Blum found on placing the finger behind the angle of the jaw on the affected side in the groove formed by the inferior maxillary bone and the anterior border of the sternomastoid, and pressing upwards toward the auditory canal, decided evidences of pain were elicited. It is constant in otitis media and is of special value in infants though it does not suffice in itself for a positive diagnosis. CLEMENS.

655. HOLMES, C. R. *Hysteria of the ear.*

The subject is carefully classified and the various divisions are discussed in detail. The author takes occasion to protest

against the propriety of undertaking or pretending to undertake an operation on the ears of such patients for the purpose of the mental effect, as such a course only confirms the belief in the reality of the hysterical symptoms and paves the way for fresh delusions. CLEMENS.

656. KERRISON, P. D. *The Eustachian tubes in infants and young children; anatomic differences as compared with the adult type; bearing upon tympanic disease.*

The author believes that, when a pharyngeal growth is clearly a factor in acute tympanic disease, the removal of the growth and incision of the drum membrane should be done at the same time. This does not mean, however, that in every case of acute otitis media we should search the nasopharynx for evidences of lymphoid hypertrophy, but when such growth is clearly a hindrance to tympanic resolution, the acute stage offers a favorable time for its removal rather than a contraindication thereto. CLEMENS.

657. SHEPPEGRELL. *Prevention of deafness.*

An examination of 11,855 cases of disease of the nose, throat, and ear, showed that 2284 cases (about 20%) had defective hearing. In children dulness and inattention were often charged when a slight deafness was at fault. The author urges a systematic testing of the hearing of school children so the defective hearing may be discovered and promptly remedied. CLEMENS.

658. KYLE, JNO. J. *Report of a case of acute suppuration of the middle ear, mastoid process, and labyrinth, due to Klebs-Loeffler bacillus.*

Patient, aged fifty, complained of severe pain in the right ear which had continued uninterruptedly for two months. The membrana tympani was found to be intact, bulging, and white; no swelling in auditory canal or over mastoid process. Myringotomy released a thick yellowish pus from the middle ear without relieving the pain. The mastoid was opened a week later, and a culture of the pus found there disclosed the presence of the Klebs-Loeffler bacillus. The true character of the disease was finally discovered through

the occurrence of the nurse in attendance coming down with a severe attack of nasopharyngeal diphtheria.

The patient had had a well-defined attack of pharyngeal diphtheria some weeks before the ear became affected, and the infection doubtless extended to the middle ear through the Eustachian tube. CLEMENS.

659. REINHARD. *Case of gonococcic otitis.*

A child of fourteen years who was suffering from gonorrheal ophthalmia developed a discharge from the right ear; the discharge was profuse and creamy white. On acetic-agar Gram-negative diplococci were found. After anti-gonorrheal treatment—consisting of irrigations of permanganate of potash 1 : 5000, and instillations of 1% protargol, rapid healing was brought about. WITTMAACK.

660. MÖLLER. *Otitic osteomyelitis of the level cranial bones.*

General review of the clinical picture of otitic osteomyelitis, including the publication of a personal case.

MÖLLER.

661. GORDING. *Mastoid resection in displaced sigmoid sinus.*

After a review of the pertinent literature in which the noteworthy investigations of Schonemann are not regarded, it is stated that during ten years in the University Ear Clinic of Christiania 674 mastoid operations were done; in 34 cases displaced sinus was found, 22 times on the right side and 12 times on the left. In one case the sinus was directly contiguous to the posterior canal wall. No mention is made of the shape of the skull. MÖLLER.

662. MOSKALEW, M., and TROFIMOW. *The etiology of suppuration of the mastoid process and its clinical appearances.*

Bacteriological examination of the pus, granulations, and bony splinters from the cells of the mastoid process was made. In 130 cases of mastoiditis streptococci in clear culture were found in 88%; in 22% a mixture of streptococcus and staphylococcus albus. SACHER.

663. BAILLEZ. *Dental pain consecutive to lesion of the facial nerve after mastoid operation.*

The author has observed pain in the teeth in patients who during a mastoid operation have had the facial nerve injured. There was a heavy, continuous pain in the teeth of the upper and lower jaws on the side of the operation, especially when the jaws were approximated in chewing. There were no inflammatory symptoms although the teeth were tender. The pain is caused by the facial nerve, which, although it is primarily motor, contains many sensory fibres obtained from the intermediate portion of the nerve of Wrisberg, the glosso-pharyngeal, the auriculo-temporal, the cervical plexus, and the trigeminus. The pain usually passes away in a few days. BRANDT.

b.—CHRONIC OTITIS.

664. THEOBALD, SAMUEL. **The conservative treatment of chronic suppuration of the middle ear.** *Jour. Am. Med. Assn.*, Nov. 23, 1907.

665. BRYANT, W. SOHIER. **Cleansing treatment of chronic suppuration of the middle ear.** *Jour. Am. Med. Assn.*, September 14, 1907.

666. REIK. **When shall we advise tympanomastoid exenteration in the treatment of suppurative otitis media and in what per cent. of cases may we expect a cure?** *Am. Jour. Med. Sciences*, August, 1907.

667. PREOBRASHENSKY. **The aspiration treatment of otorrhea.** *Monatsschr. f. Ohrenhlk.*, 1907, p. 402.

668. HALASZ. **On the extraction of the ossicles by Neumann's method.** *Monatsschr. f. Ohrenhlk.*, 1907, Pt. 4, p. 212.

669. BEZOLD. **The elimination of a labyrinth sequestrum in a phthisical patient following cauterization of the tympanum.** *Arch. internat. d'otol., etc.*, vol. xxiv., p. 1.

670. HEINE. **On labyrinth suppurations.** *Deutsche med. Wochenschr.*, No. 32, 1907.

671. WEST and SCOTT. **Operative surgery of labyrinthitis based on an experience of thirty cases.** *Proceedings of the Royal Society of Medicine, Otological Section*, vol. i., No. 6, 1908, p. 37.

672. RICHARDS, J. D. **Surgery of the labyrinth.** *Laryngoscope*, October, 1907.

664. THEOBALD, SAMUEL. *The conservative treatment of chronic suppuration of the middle ear.*

Constitutional treatment is as important as local measures. Apart from nasal operations, surgical work on the ear is seldom called for unless there is mastoid involvement. The

use of antiseptic solutions is advocated in place of powders, bichloride of mercury and boric acid being the most useful in the author's hands. Any concurrent nasal disease or systemic condition on which the ear trouble may depend must be treated. The cases least amenable to treatment are not those with extensive destruction of the drum, but where there is a small perforation in the membrana flaccida. If the drainage is free antral disease disappears when the tympanic trouble is controlled. The administration of pyrophosphate in liberal doses is strongly recommended.

CLEMENS.

665. BRYANT, W. SOHIER. *Cleansing treatment of chronic suppuration of the middle ear.*

If the drainage in chronic suppuration of the middle ear is sufficient and there are no collections of inspissated material, dry wiping followed by application of boric acid powder gives rapid results. Where there is a collection of cheesy matter within the tympanum the use of the intratympanic syringe is found of much service, but should its application fail the employment of suction is recommended. Should an area of caries be found treat it by cleanliness and *stimulate* any accumulation of granulations with nitrate of silver. After these means of treatment the ear usually becomes clean and sweet, but in a certain number of cases serous discharge continues. To overcome this all unnecessary irritation of the tympanum must stop and use astringents, either dry or in solution. Powders of boric acid and xeroform bismuth tribrom-phenolate are considered of value. When relapses occur they are treated according to the indication the ear presents at the time. CLEMENS.

666. REIK, H. O. *When shall we advise tympanomastoid exenteration in the treatment of suppurative otitis media and in what per cent. of cases may we expect a cure?*

The author believes when it becomes evident that the usual simple measures and minor operations cannot cure the disease in question, tympanomastoid exenteration should be advised unless in a given case there exists some special reason of socio-economical character that justifies delay.

The percentage of cures in obstinately chronic cases is estimated approximately at 70%. CLEMENS.

667. PREOBRASHENSKY. *The aspiration treatment of otorrhœa.*

See 556.

668. HALASZ. *On the extraction of the ossicles by Neumann's method.*

The author has employed Neumann's method with satisfaction in a number of cases. WITTMAACK.

669. BEZOLD. *The elimination of a labyrinth sequestrum in a phthisical patient following cauterization of the tympanum.*

Bezold has already published 13 cases of labyrinth necrosis; in this paper an additional 14th case is reported. The ear was carefully examined as well as the function of the vestibular apparatus. The removed sequestrum corresponded to the promontory wall; it extended upwards to the margin of the oval window, so the facial nerve was not involved. The course of the disease showed that the cauterization undertaken by another physician was the cause of the sequestration. Bezold, therefore, warns against cauterization by chemical means or with the galvano-cautery wire and insists that granulations should only be removed with the snare or curette. OPPIKOFER.

670. HEINE. *On labyrinth suppurations.*

After a short anatomic description of the labyrinth, the mode of production of labyrinth suppuration, together with diagnostic points, is given. Finally there is a short description of the methods of operating. Heine, in view of the fact that at the Berlin Ear Clinic fistula of the horizontal semicircular canal was so frequently observed (207 times in 277 cases of labyrinth suppuration), insists upon the importance of this region as a site for the development of purulent labyrinth disease. The difficulties of diagnosis are mentioned, which, notwithstanding the painstaking efforts of v. Stein, Wanner, Kümmel, Hinsberg, Bárány, and others, are still great, and in many cases it is only at the operation that the site and extent of the disease are discovered. The author leaves a defect in the horizontal semicircular canal

untouched, even when nystagmus and vertigo are present, as the defect sometimes heals spontaneously, and the danger is always present that the operation may convert a circumscribed inflammation of the labyrinth into a diffuse one. The labyrinth, however, should be opened when before the operation it is found that the vestibular apparatus can no longer be excited, or when labyrinth symptoms do not disappear after operation, but on the other hand become aggravated or appear for the first time; even in those cases where the site of the perforation of the labyrinth has not been demonstrated and every other cause for the labyrinth symptoms can be excluded. NOLTENIUS.

671. WEST and SCOTT. *Operative surgery of labyrinthitis based on an experience of thirty cases.*

After reference to the work of other operators, the authors give a minute description of the anatomy of the labyrinth, of the morbid appearance, and particularly of the paths of infection. In nine of the thirty cases, no "labyrinthine" symptoms were present, but in most instances vertigo, vomiting, and deafness were marked. Tinnitus was only complained of in three, severe deep-seated pain in the ear in four, and headache in four cases. The temperature and pulse were in no case characteristic and spontaneous nystagmus was not observed.

The authors consider that the labyrinth should always be operated on if an affected labyrinthitis could be diagnosed.

With regard to results: in every case in which vertigo was present at the time of operation, the patient was completely relieved. In no case was useful hearing present at the time of operation, but in the majority the hearing power was already defective or absent before operation. In no case was there permanent facial paralysis as the result of operation. Although there was a mortality of 17%, in only 3% was the operation considered the actual cause.

This paper can only be appreciated if read in extenso.

HUNTER TOD.

672. RICHARDS, J. D. *Surgery of the labyrinth.*

In a very comprehensive article illustrated by sixteen

colored plates, the author demonstrates in a series of eleven cases the unreliability of labyrinthine localization. He found the horizontal semicircular canal, either alone or in combination with other lesions of the capsule, involved in nine; the oval window was perforated in five; the promontory, or first cochleal whorl in one; the labyrinthine capsule in the solid angle of the semicircular canals in one; the inner vestibular wall in one. In all there were seventeen perforations in the eleven cases, sixteen through the outer labyrinthine wall, and one through the inner. The route selected for the entrance of the labyrinth is posterior to the facial nerve, the point being the solid angle of the semicircular canals. Great care must be taken that the chisel does not cross the cavity of the vestibule and impinge upon its inner wall. Should this wall be fractured the cerebro-spinal fluid will be lost, which aside from the inconvenience may jeopardize the patient's life. Sterile wax should be used to plug the rent. Large quantities of sugar and acetone may appear in the urine after this operation. In three cases where the major portion of the labyrinth was removed, including the semicircular canals, there appeared to be after a lapse of over two years in the first, one year in the second, and nine months in the third, no sign of muscular atrophy of either side of the body. CLEMENS.

c.—CEREBRAL COMPLICATIONS.

673. BEVER. **The ways of extension of middle-ear suppurations to the brain and the development of cerebral abscesses.** *Dissert.*, Erlangen, 1907.

674. RABOTNOW. **Statistics of otitic intracranial complications according to Russian authors.** *Russische Monatsschr. f. Ohrenhlk., etc.*, June, 1907.

675. SIEUR. **Three cases of cerebral abscess and remarks on the surgical treatment of endocranial otitic complications.** *Arch. internat. d'otol., etc.*, vol. xxiv., p. 16.

676. DE CELIO-CEYA. **Cases of difficult differential diagnosis from practice (left-sided cerebral abscess of otitic origin in the temporal lobe). Malarial epileptoides.** *Wiener klin. therapeutische Wochenschr.*, No. 32, 1907.

677. WICART. **Abscess of the spheno-temporal lobe of otitic origin.** *Thèse de Paris*, 1906.

678. BROSCHNIOWSKI. **Cerebral abscess of otitic origin. Operation. Recovery.** *Wiener med. Presse*, No. 28, 1907.

679. VIGARD and SARGNON. **Otitic intracranial complications.** *Arch. internat. d'otol., etc.*, 1907, No. 6.

680. CHEVAL. **Injury of the meninges of the brain and the lateral ventricle after a foreign body had entered the ear. Meningitis; operation; recovery.** *La presse otolaryn.*, 1907, Pt. 8.

681. POTTS, BARTON H. **Report of a case of septic meningo-encephalitis or cerebritis.** *N. Y. Med. Jour.*, Sept. 21, 1907.

682. BLACK. **Cerebellar abscess following acute suppuration of middle ear.** *Laryngoscope*, July, 1907.

683. PATERSON, D. R. **Crossed abducens paralysis in a case of cerebellar abscess.** *Proceedings of the Royal Society of Med., Otol. Section*, vol. i., No. 6, 1908, p. 88.

673. BEVER. *The ways of extension of middle-ear suppurations to the brain and the development of cerebral abscesses.*

A description of the methods of extension based on the literature is given, also two cases of otitic temporal lobe abscess which were observed in Bezold's clinic. One case is noteworthy because the pus extended into the cranial cavity through the intervention of a dehiscence in the tegmen tympani; the second case is remarkable because a right-sided abscess caused aphasia and paraphasia. The patient was left-handed for heavy work though he used his right side for writing. HARTMANN.

674. RABOTNOW. *Statistics of otitic intracranial complications according to Russian authors.*

The statistic data include 504 cases and the results are about the same as for other European authors. The only deviation may be in the fact that in the cases of Russian authors the intracranial complications appear to occur more frequently on the left side. A case of interest is that of sarcoma of the temporal bone in a woman who had suffered from chronic purulent otitis. SACHER.

675. SIEUR. *Three cases of cerebral abscess and remarks on the surgical treatment of endocranial otitic complications.*

Histories are given of three cases of abscess of the temporal lobe, one following acute otitis, two chronic otitis. The difficulties of diagnosis and indications for operation are discussed. OPPIKOFER.

676. DE CELIO-CEYA. *Cases of difficult differential diagnosis from practice (left-sided cerebral abscess of otitic origin in the temporal lobe). Malaria epileptoides.*

A man, thirty-four years of age, who had been suffering with malaria was taken ill with high fever, chills, sweats, and vomiting. The left drum presents a picture of an old, chronic middle-ear process but without any discharge. The symptoms were not influenced by quinine. After two days convulsions set in. The same symptoms were presented every year by a number of cases of atypical malaria—the so-called malaria epileptica. The examination of the blood revealed a leucocytosis, a variation in form of the red blood corpuscles, poikilocytosis, reddish-brown granular pigment enclosed in some of the blood corpuscles. At autopsy there was an abscess filled with thick, purulent, green pus, which communicated with the petrous bone where the bone was softened and carious. The temporal bone was not concerned.

WANNER.

677. WICART. *Abscess of the spheno-temporal lobe of otitic origin.*

In this dissertation four cases are described and the symptoms and treatment of otitic temporal lobe abscess are given. There is nothing new. There is also a case of thrombosis of the cavernous sinus, two cases of purulent meningitis of otitic origin, and a case of hysteria which simulated otitic abscess. OPPIKOFER.

678. BROSCHNIOWSKI. *Cerebral abscess of otitic origin. Operation. Recovery.*

A case of acute otitis (left) in which the temperature only rose three times to 38° C. The suppuration was soon cured but severe headache followed. After six or eight weeks loss of consciousness; ten days later operation. The drum was slightly reddened and cloudy, otherwise normal. No pus could be found in the mastoid, but the antrum and tegmen tympani were softened and hyperemic. The dura was exposed to the extent of 4*cm* and after incision three tablespoonfuls of pus were evacuated. The abscess cavity was curetted and drainage tube put in. On the following day

complete return to consciousness. The abscess was closed in two weeks and the function of the nervous system became normal. Because of the possibility of acute suppuration the radical operation was performed. WANNER.

679. VIGARD and SARGNON. *Otitic intracranial complications.*

The authors give the histories of 6 cases of extra-dural otitic abscess, some of them with sinus thrombosis; they also cite 2 cases of serous meningitis and 1 case of temporal lobe abscess, the latter in a three-year-old child. The abscess was found at operation; the patient died of purulent meningitis. Finally the histories are given of 5 severe cases of cholesteatoma, in which 2 led to intracranial complications.

OPPIKOFER.

680. CHEVAL. *Injury of the meninges of the brain and the lateral ventricle after a foreign body had entered the ear. Meningitis; operation; recovery.*

The title gives the contents of this short paper. BRANDT.

681. POTTS, BARTON H. *Report of a case of septic meningoencephalitis or cerebritis.*

The unusual feature of this case was the duration of the condition without pus formation notwithstanding the presence of suppuration in the ears and mastoids. The autopsy showed some injection of the pia and dura, plastic exudate at the base, considerable hemorrhage about the site of operation and along the lines of the punctures; brain markedly œdematous, ventricles normal, an absence of pus. The condition confirms the diagnosis, septic in origin and doubtless superimposed by his alcoholic excesses. CLEMENS.

682. BLACK, W. D. *Cerebellar abscess following acute suppuration of middle ear.*

The mode of infection in this case seemed to be through the lymphatics, as the sigmoid sinus and the osseous walls about it were healthy. The abscess was about the size of a hickory nut and contained about one-half an ounce of thick greenish pus, and situated about the centre of the lateral

lobe. There was no apparent connection with the lateral sinus. CLEMENS.

683. PATERSON, D. R. *Crossed abducens paralysis in a case of cerebellar abscess.*

A case of cerebellar abscess on the right side, the result of chronic middle-ear suppuration. The cerebellum was explored in front of the lateral sinus; the abscess found and drained. An uninterrupted recovery took place. Before operation there was optic neuritis on both sides and distinct weakness of the left external rectus which gradually developed into a definite squint. After operation the eye symptoms gradually disappeared. HUNTER TOD.

d.—DISEASES OF THE SINUS.

684. NÜRNBERG. **The value of negative results of bacteriological examination of sinus blood in the differential diagnosis between otitic sinus thrombosis and other obscure febrile conditions.** *Münch. med. Wochenschr.*, 1907, No. 51.

685. GROSSMANN. **Primary otitic thrombosis of the bulb of the internal jugular vein.** *Arch. f. klin. Chirurgie*, vol. lxxxv., Pt. 1.

686. UHTHOFF. **On the eye symptoms of thrombosis of the cerebral sinus.** *Monatsschr. f. Psychiatrie u. Neurol.*, 1907, p. 383.

687. UCHERMANN. **A case of fatal venous hemorrhage from the ear in a nursling.** *Norsk mag. f. lag.*, 1907, p. 1425.

688. HOFER. **Case of otitic sinus thrombosis in acute purulent otitis.** *Wiener med. Wochenschr.*, No. 33, 1907.

689. TOD, HUNTER. **Lateral sinus thrombosis; subsequent meningitis (meningitis serosa); recovery.** *Proceedings of the Royal Society of Medicine, Otol. Section*, vol. i., No. 5, 1908, p. 30.

684. NÜRNBERG. *The value of negative results of bacteriological examination of sinus blood in the differential diagnosis between otitic sinus thrombosis and other obscure febrile conditions.*

This is a report from Leuter's clinic of a case of chronic purulent otitis which ran a very high fever and which on puncture of the sinus gave sterile blood. The further course showed that erysipelas was the cause of the fever. At a second puncture bacteria were found, but the needle penetrated a part of the sinus which had been in contact for two days with pus in the mastoid process. It is therefore important that a puncture should only be undertaken in a freshly

exposed region as near as possible to the bulb, otherwise a thrombus in the latter region may be overlooked. Leuter's blood examinations which are well known to the readers are mentioned. SCHEIBE.

685. GROSSMAN. *Primary otitic thrombosis of the bulb of the internal jugular vein.*

Primary thrombosis of the jugular bulb is only relatively infrequent; in every four to six cases of otitic pyæmia it occurs at least once. Contrary to the view of Leutert and Grunert contact thrombosis is more frequent than that caused by embolism. Peribulbar abscess is sometimes the cause and sometimes the result of bulb thrombosis. Primary abscess is sometimes the cause and sometimes the result of bulb thrombosis. Primary parietal bulb thrombosis is always only a diagnosis of probability. In secondary bulb thrombosis, after the removal of the infecting thrombus from the sigmoid sinus, recovery occurs with or without ligation of the jugular vein. In primary bulb thrombosis, when continuous high fever in the course of an acute, especially in subacute, rarely in chronic otitis, is present, when after exploration of the sigmoid fossa an extrasinus abscess or parietal thrombus is found, when no meningitis is present and no other disease of the body, it is not wise to wait for the onset of pyæmic metastases before operating. It is best in a parietal as well as in an obturating primary bulb thrombosis to ligate the jugular before exposing and resecting the bulb.

HARTMANN.

686. UHTHOFF. *On the eye symptoms of thrombosis of the cerebral sinus.*

In otitic sinus phlebitis, choked disk was present in 18%, and optic neuritis in 24% of the cases. Both changes in the optic disk are found more frequently in sinus phlebitis which is complicated with other otitic intracranial suppurations than in uncomplicated cases. These results confirm what the reviewer has pointed out to be the case some time ago.

KÖRNER, ROSTOCK.

687. UCHERMANN. *A case of fatal venous hemorrhage from the ear in a nursling.*

A child aged one year developed an acute swelling on the

left side of the neck, and later a purulent discharge from the ear. After this had persisted for four days there was sudden hemorrhage from the ear. The child was brought to the hospital and hemorrhage recurred. Partial resection of the mastoid process proved this to be healthy. The posterior auditory canal wall was resected. It was then found that the hemorrhage originated from the anterior canal wall directly at the drum. Subsequently there was pyæmia with pleuro-empyæmia. Fourteen days later death, following renewed severe hemorrhage. At autopsy an opening was found at the junction between the anterior and posterior auditory canal wall directly beyond the drum, which led into an abscess cavity, which through a small opening communicated with the internal jugular vein. JÖRGEN MÖLLER.

688. HOFER. *Case of otitic sinus thrombosis in acute purulent otitis.*

In a soldier twenty-two years of age, after an acute right-sided purulent otitis, in the second week there were symptoms of sinus thrombosis. At operation there were found in the antrum and in the cells pus and a few granulations; small extradural abscess. At this place the thrombus, which extended from the torcular to the bulb, was somewhat softened. The thrombus was removed and the sinus loosely packed. Streptococci were found in the pus. At the time of the operation the middle-ear process had ceased. WANNER.

689. TOD, HUNTER. *Lateral sinus thrombosis; subsequent meningitis (meningitis serosa); recovery.*

In performing the complete mastoid operation, the outer wall of the lateral sinus was found to be already exposed within the cavity. Symptoms of thrombosis occurred a few days later. The wound was reopened and the sinus obliterated above and below the affected area. Ten days later facial paralysis occurred on the opposite side with paresis of both external recti muscles, and optic neuritis on the affected side. This was accompanied by drowsiness, headaches, and marked emaciation. Gradual improvement took place with recovery from the facial paralysis; the optic neuritis subsided on the affected side but on the opposite

side optic atrophy occurred and still persists, with almost complete blindness. Otherwise the patient is well, with complete healing of the mastoid wound. HUNTER TOD.

e.—OTHER MIDDLE-EAR DISEASES.

690. YEARSLEY, MACLEOD. **Subacute and chronic middle-ear deafness.** *The Practitioner*, 1908, lxxx., p. 115.

691. TOD, HUNTER. **Primary epithelioma of the tympanic cavity with secondary infection of the skin over the mastoid region.** *Proceedings of the Royal Society of Medicine, Otol. Section*, vol. i., No. 3, 1908, p. 15.

692. SUGAR. **On the internal treatment of chronic middle-ear catarrh.** *Wiener klin. therapeutische Wochenschr.*, Nos. 37, 38, 1907.

693. MADER. **Menthol vapor apparatus for the treatment of catarrh of the Eustachian tubes.** *Münch. med. Wochenschr.*, 1907, No. 37.

694. ZYTOWITSCH. **On the treatment of otitic sclerosis with the faradic current.** *Russkij Wratsch.*, Nos. 6, 8, and 11, 1907.

695. PIFFL. **Foreign body in the right Eustachian tube; abscess at the base of the skull; suppurative involvement of the atlanto-occipital articulation; aneurysm of the left vertebral artery; death from rupture of this vessel.** *Arch. f. Ohrenhlk.*, vol. lxxii., pp. 77–93.

690. YEARSLEY, MACLEOD. *Subacute and chronic middle-ear deafness.*

Causes and treatment are reviewed. Yearsley condemns the use of the Politzer bag as being a dirty and unscientific method and habitually uses the Eustachian catheter for all inflations. Strychnine is recommended as a valuable internal remedy in the later stages of catarrhal inflammation; special emphasis is made of the point that it should be given in large doses, being best administered in the form of tabloids of a thirtieth of a grain three times daily and increasing the dose by one tabloid per diem until the limit of tolerance is reached.

Of the numerous operations suggested for chronic middle-ear catarrh, Yearsley considers mobilization of the fixed malleus as the most valuable and successful.

HUNTER TOD.

691. TOD, HUNTER. *Primary epithelioma of the tympanic cavity with secondary infection of the skin over the mastoid region.*

There was a history of otorrhœa for six months. Owing

to the repeated occurrence of granulations, ossiculectomy was performed and eventually the complete mastoid operation. Further occurrence of exuberant granulations suggested malignancy, which was confirmed onm icroscopic examination. At subsequent operations more bone was removed, the branches of the external carotid ligatured, and the lymphatic glands in the anterior and posterior triangle of the neck were excised. Complete healing took place within the tympanic cavity. The posterior mastoid wound at first also healed, but afterwards localized thickening occurred at its lower margin, subsequently giving rise to the formation of a typical epitheliomatous ulcer which did not seem to be connected with the underlying bone. The interesting point is the secondary infection of the skin in spite of apparent cure within the mastoid process. HUNTER TOD.

692. SUGAR. *On the internal treatment of chronic middle-ear catarrh.*

The author advises thiosinamine and various other medicines which are given internally in the treatment of middle-ear catarrh, for the relief of tinnitus. WANNER.

693. MADER. *Menthol vapor apparatus for the treatment of catarrh of the Eustachian tubes.*

The apparatus consists of a glass flask and spirit lamp in which menthol and oleum pumilionis are warmed. The developing menthol vapor is then forced into the middle ear by means of a catheter and bulb. It seems that the author does not know of the menthol capsule, which needs only to be crushed and used with a rubber bulb apparatus.

HARTMANN.

694. ZYTOWITSCH. *On the treatment of otitic sclerosis with the faradic current.*

On the basis of a number of observations the author comes to the following conclusions: 1. In all patients suffering from otosclerosis the function of the tensor tympani was either entirely lost or greatly diminished. In rare cases the function of this muscle is retained, in which event the stapedius is the one involved. 2. Tinnitus disappears on faradization, or becomes much less severe. 3. Hearing is

improved by this method, probably by improving the accommodative ability. 4. In the use of faradization one electrode must be placed in the pharyngeal opening of the Eustachian tube, the head of the electrode being placed in contact with the upper wall; the second electrode had best be placed in the angle between the lower jaw and the mastoid process. 5. The strength of the current varies in different patients—in general it must be as strong as the patient can tolerate. 6. Duration of the sitting—three to five minutes; frequency—not less than three times a week. SACHER.

695. PIFFL. *Foreign body in the right Eustachian tube; abscess at the base of the skull; suppurative involvement of the atlanto-occipital articulation; aneurysm of the left vertebral artery; death from rupture of this vessel.*

This paper is characterized by the remarkable nature of the case, one which for its rarity, course, and severity of its complications cannot be paralleled in otitic literature. Moreover, the description is unusually interesting, and together with the review of the literature, the clinical observations, and anatomical investigations it furnishes a clear and comprehensive picture of this complicated case. The reviewer thinks that all will read and study this extensive paper with great pleasure.

ZARNIKO.

NERVOUS APPARATUS.

696. MAYER. **Diseases of the ear in progressive general paralysis.** *Arch. f. Ohrenhlk.*, vol. lxxii., pp. 94–122.

697. KUSTNER. **On tumors of the auditory nerve and their diagnosis.** *Arch. f. Ohrenhlk.*, vol. lxxii., pp. 1–10.

698. URBANTSCHITSCH. **Disturbances of speech and writing, paresis of the upper and lower extremities originating in sensory nerves in the middle ear.** *Monatsschr. f. Ohrenhlk.*, 1907, p. 365.

696. MAYER. *Diseases of the ear in progressive general paralysis.*

At Habermann's clinic the author examined histologically nine temporal bones and two brains from five paralytics. It was found: 1. That there are in progressive paralysis degenerative changes in the auditory nerve (of the nerve, ganglion or branches) which are intermediary and of a tabetic nature. 2. In addition to this tabetic atrophy there is probably

also a marantic degenerative neuritis of the auditory nerve. 3. In many cases there is a marked chronic inflammation of the meninges, usually of a hemorrhagic character. 4. In the nerves themselves there are interstitial inflammatory processes. 5. Degenerations are found in the circulatory apparatus of the internal ear depending upon sclerotic changes in the blood-vessels, causing secondarily an atrophy of Corti's organ. In order to obtain some clinical observations on disturbances of hearing in paralytics, ten patients of the Insane Asylum of Feldhof were examined by the author. He reaches the following conclusions: 1. The symptoms of disturbed auditory function in the beginning stages of paralysis depend generally upon peripheral changes in the auditory apparatus, although central causes cannot be excluded. 2. Deafness in progressive paralysis is in most cases due to a degeneration of the cochlea which is generally of a tabetic nature. Sclerotic and senile changes are observed in the later stages, but are not prominent in the clinical symptom picture. ZARNIKO.

697. KUSTNER. *On tumors of the auditory nerve and their diagnosis.*

The auditory nerve has been the seat of fibroma, sarcoma, gummata, neuroma, and glioma, but generally of mixed tumors, as gliofibroma, neuroglioma, or fibrosarcoma. The new formation rarely occurs in the auditory tract itself, but the base of the skull (cerebellar auditory recess), and thus injures the nerve by compression. It is remarkable that the auditory nerve has been found affected three times as often as the adjacent facial nerve. For the diagnosis there are: 1. Prodromal symptoms: slow but steady diminution of hearing with the absence of any demonstrable ear disease; head pressure; vertigo; weakness in the extremities. 2. General symptoms: symptoms of brain pressure, choked disk, vomiting, sometimes lesion of the optic nerve leading to atrophy, dulness, severe pain in the cerebellar region. 3. Head symptoms: lesions of the auditory nerve: (*a*) vomiting, frequently presenting a typical picture of Ménierè's disease; (*b*) hearing disturbances up to complete nerve deafness. 4. Symptoms of immediately surrounding structures: (*a*) Disturbances of innervation of the extremities, of a motor

and sensory character; (*b*) disturbances in the region of the auditory nerve; paresis of the eye muscles, nystagmus, paresis of the abducens, oculomotor, trigeminus and facial nerves; more rarely changes in the glossopharyngeal, vagus, accessory, and hypoglossal. According to the author, therefore, there is a well characterized picture present in those cases where before complete nervous deafness there are various disturbances of the nerves in the posterior cerebellar region. There are no means of accurately differentiating between tumors of the auditory nerve and those occurring in the cerebellar region. ZARNIKO.

698. URBANTSCHITSCH. *Disturbances of speech and writing, paresis of the upper and lower extremities originating in sensory nerves in the middle ear.*

The author reports on further cases of paralysis of the lower extremities in the course of ear disease. Two cases are of paralysis of the left upper and lower extremities, which in one case was brought about by a left-sided and in the other by a right-sided middle-ear suppuration; in a third case there was paralysis of both lower extremities produced by a bilateral otitis. In the former case the middle-ear disease produced stuttering and pain in the left shoulder, and in the third, burning in the heels. Further, the author gives the case history of a woman fifty-one years of age with aphasic disturbances (sensory aphasia and agraphia) which were improved and finally cured after treatment of a simultaneous, right-sided suppuration of the antrum of Highmore. Finally, various writing specimens are given of a case where a tampon in the right tympanum caused a slight disturbance in writing, while packing in the right side of the nose caused a marked disturbance. WITTMAACK.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY AND TREATMENT.

699. ZIEM. **On the importance of nasal affections in the treatment of scrofulous diseases.** *Monatsschr. f. Ohrenhlk.*, 1907, No. 6, p. 312.

700. WOLF. **Case of atrophy of the optic nerves with spontaneous discharge of cerebro-spinal fluid from the nose.** *Inaugural Dissertation*, Rostock, 1907.

701. GOLDSCHMIDT. **On the question of nasal packing.** *Monatsschr. f. Ohrenhlk.*, 1907, Pt. 5, p. 273.

702. GRÜNBERG. **On the treatment of tuberculosis of the nose, pharynx, and larynx with iodin and mercury.** *Münch. med. Wochenschr.*, 1907, No. 34.

703. WEDERHAKE. **On paraffine prosthesis.** *Deutsche med. Wochenschr.*, No. 40, 1907.

704. SCHLOSSER. **Further report on a case of tumor of the hypophysis which had been operated upon. (Sudden death 2½ months after operation.)** *Wiener klin. Wochenschr.*, No. 26, 1907.

705. EISELSBERG and FRANKL-HOCHWART. **On the operative treatment of tumors of the hypophysis.** *Wiener med. Wochenschr.*, No. 39, 1907.

706. RICHTER, G. **Art of gargling.** *Med. Record*, Dec. 14, 1907.

707. STIMSON, A. B. **Primary nasal diphtheria, with report of several cases, one an infant ten days old.** *N. Y. Med. Jour.*, Dec. 14, 1907.

708. JOHNSTON, RICHARD H. **Obstruction in the nose or in the throat as cause of nervous and mental diseases in school life.** *N. Y. Med. Jour.*, Nov. 30, 1907

709. BRYANT, W. SOHIER. **The nose in its relation to epilepsy.** *Med. Record*, Nov. 23, 1907.

710. SEIBERT, A. **Prophylaxis in epidemic cerebro-spinal meningitis.** *Jour. Am. Med. Assn.*, Nov. 20, 1907.

711. HOLMES, B. **Influence of trauma in localizing infection in the natural mucous cavities of the body.** *Lancet-Clinic*, Nov. 2, 1907.

712. INGALS, E. FLETCHER. **The relation of tonsillitis and rheumatism.** *Laryngoscope*, Sept., 1907.

713. KERLEY, C. G **Questionable influence of the so-called dietetic condition in diseases of the throat and nose in children.** *N. Y. Med. Jour.*, August 24, 1907.

714. HABERMAAS, A. **The treatment of diphtheria with refined and concentrated antitoxin.** *St. Louis Med. Review*, August, 1907.

715. HURD, L. M. **Differential diagnosis of tuberculosis and syphilis of the upper respiratory tract.** *Laryngoscope*, July, 1907.

716. SOLIS-COHEN, M. **Latent diphtheria. A public-health problem.** *Jour. Am. Med. Assn.*, July 6, 1907.

699. ZIEM. ***On the importance of nasal affections in the treatment of scrofulous diseases.***

The author draws attention to the importance of certain nasal diseases in the treatment of so-called scrofulous eye diseases, which in the opinion of the author are not always due to tuberculosis but may result from malaria, influenza, measles, scarlet fever, and other infectious diseases. In addition to the local treatment of the eyes, general treatment,

and especially the presence of fever, should be given attention. The special therapeutic measures must be read in the original.

WITTMAACK.

700. WOLF. *Case of atrophy of the optic nerves with spontaneous discharge of the cerebro-spinal fluid from the nose.*

After the report of a case observed in the Rostock eye clinic the author has collected similar cases from the literature. Of the eighteen collected cases five were examined post-mortem. It seems that in these eighteen cases the simultaneous appearance of spontaneous discharge of cerebro-spinal fluid and optic-nerve atrophy does not represent an etiologically similar morbid process, but is to be regarded only as a symptom complex which may occur in various cases of cerebral disease differently localized, and dominate the clinical picture.

ROPKE.

701. GOLDSCHMIDT. *On the question of nasal packing.*

In place of packing in mild cases the author recommends the use of mixed renoform and boric acid powder in the nose, which the patient is to use every fifteen to twenty minutes after the operation for some hours. When packing is necessary it is best to use gauze soaked in renoform solution.

WITTMAACK.

702. GRÜNBERG. *On the treatment of tuberculosis of the nose, pharynx, and larynx with iodin and mercury.*

In this case where tuberculosis was proven by microscope and animal inoculation, recovery took place after four and one half months of treatment with iodide of potash and especially mercury. As others have reported similar favorable results in tuberculosis, the author warns against concluding that syphilis is present owing to the favorable influence of this form of treatment. The reviewer has observed a case of lupus which also healed under the use of iodide of potash and locally calomel, while the nodules in the skin did not disappear until after Finsen treatment.

SCHEIBE.

703. WEDERHAKE. *On paraffine prosthesis.*

To diminish the possibility of embolism the author uses

a mixture composed of 1*gr.* of pure rubber and 13*gr.* of hard paraffine with a melting point of 58° which are heated in a porcelain dish and triturated until the rubber is dissolved. If bone is to be replaced, 1*gr.* of precipitated calcium carbonate is added and this mixture must be injected in a warm if not a hot condition. NOLTENIUS.

704. SCHLOSSER. *Further report on a case of tumor of the hypophysis which had been operated upon (sudden death two and one half months after operation).*

The autopsy showed that the size of the tumor had been underestimated and a large part of it remained which extended into the basal part of the frontal lobes. The operative wound at the base of the skull was found to be healed by firm scar tissue. Eight days before death there were headache, nausea, vomiting, and constipation. The improvement which existed until shortly before death the author believes to have been due to the relief of pressure. WANNER.

705. EISELSBERG and FRANKL-HOCHWART. *On the operative treatment of tumors of the hypophysis.*

A patient twenty years of age suffered in his twelfth year from paroxysms of headache and vomiting. At the age of fourteen, vision in the left eye diminished, and there were hemianopsia and marked development of adipose tissue. These disturbances disappeared upon treatment with thyroid gland. In 1907 there was a return of the hemianopsia, also right-sided atrophy of the temporal half of the papilla; genuine atrophy of the left; scanty development of the hair on the body. Radiographs revealed the destruction of the pituitary body, sella turcica, and posterior clinoid process. Operation: After displacing the nose to the right, division of the septum, removal of superior turbinates, exposure of the frontal sinus. The anterior wall of the frontal sinus was opened and removed; resection of the vomer to its origin; detachment of the periosteum to the anterior wall of the pituitary cavity. This cavity was opened and in the depths a white membrane appeared. Incision in the middle line was followed by the escape of several tablespoonfuls of bloody fluid which had filled a tumor cavity. This proved to be a cyst occupying

the position of the hypophysis. After removal of the walls the cavity was packed with iodoform gauze. Examination of the walls of the sac suggested carcinoma. The wound was healed in twelve days. The headache practically disappeared and vision improved. WANNER.

706. RICHTER, G. *Art of gargling.*

The author proposes the following method: The head should be bent as far backward as possible with the tongue protruded. In this position an attempt is made to swallow the gargling fluid which causes it to well upwards into the naso-pharynx and nostrils, then by suddenly throwing the head forward the fluid runs out of the nostrils, thoroughly cleansing the passages. CLEMENS.

707. STIMSON, A. B. *Primary nasal diphtheria, with report of several cases, one an infant ten days old.*

Five cases are reported by the author who calls attention to the following points: The disease is more common than is usually supposed; it is usually benign, the primary form seldom malignant in itself, and especially is this so if the disease remains confined to the nares; it tends to limit itself to the nose, but increases in gravity pari passu with extension; it tends towards chronicity, is of good prognosis, and paralytic phenomena are extremely rare; it acts as a focus of infection, however, and the resulting cases may be of a malignant type. CLEMENS.

708. JOHNSTON, RICHARD H. *Obstruction in the nose or in the throat as cause of nervous and mental diseases in school life.*

The real nature of mental and nervous troubles in these cases is looked upon to be toxic due to a deficiency of oxygen in the inspired air. Among the symptoms mentioned are: mental dulness, restlessness, night terrors, nocturnal incontinence, headaches, defects of speech, choreic movements of the face, reflex nervous cough, and irritability.

CLEMENS.

709. BRYANT, W. SOHIER. *The nose in its relation to epilepsy.*

In the rhinologic examination of forty-eight cases of epileptic

insanity all were found to have extensive abnormalities of the nares and many had suppuration and sinusitis. Although the work has not as yet been completed there is noticed a slight decrease in the number of epileptic seizures and slight increase in the general mental and physical condition. The author believes that epilepsy is a normal symptom consequent on over-stimulation (largely reflex in character) of the higher centres of the cord and brain. The most common cause of epileptic seizures is reflexes from Schneiderian irritation through the fifth nerve. CLEMENS.

710. SEIBERT, A. *Prophylaxis in epidemic cerebro-spinal meningitis.*

The prophylactic means employed is to destroy the meningococcus in the naso-pharyngeal mucus and mucosa. The author uses equal parts of resorcin and alcohol. The alcohol must be heated before the resorcin is added. Two applications on cotton, one past each side of the uvula, reaching to the ceiling of the naso-pharynx, are sufficient. Six treatments usually suffice to stop all secretions of postnasal mucus. Infants one month old bear the treatment equally as well as adults.

This treatment has also been used with good results in destroying the streptococci in scarlatinous pharyngitis. The frequency of the applications depend on the advanced condition of the case. The pharynx has been disinfected after attacks of pneumonia, diphtheria, tonsillitis, influenza, and measles to prevent early recurrence and transmission to others. CLEMENS.

711. HOLMES, B. *Influence of trauma in localizing infection in the natural mucous cavities of the body.*

It is thought that some long-forgotten traumatism is responsible for infection in the mucous cavities causing obstruction. Fractures of the base of the skull and injuries to the temporal bone following mastoid infection or trouble in the cranial sinuses are mentioned. CLEMENS.

712. INGALS, E. FLETCHER. *The relation of tonsillitis and rheumatism.*

From an analysis of the cases examined and studied, the

author draws the following conclusions: 45% of the cases of tonsillitis have a rheumatic history, but 16% of other affections of the throat and chest also have a rheumatic history so that not more than 29% of the cases of acute tonsillitis can be fairly attributed in any way to the rheumatic poison, and more than one half of these are doubtful. In 8% the cases were attended by or immediately followed by articular rheumatism; the same number claimed to have had muscular rheumatism, and in 5% the attack immediately preceded the angina. It is not proved that the tonsil is the only or chief portal for the entrance of rheumatic poison. There is no evidence to justify the belief that inflammation of the tonsil may prevent, or take the place of, an attack of rheumatism. CLEMENS.

713. KERLEY, C. G. *Questionable influence of the so-called dietetic condition in diseases of the throat and nose in children.*

The author does not find that any special type of constitution markedly tends towards the development of adenoids or enlarged tonsils. He thinks the habit of sucking the thumb in early childhood favors the production of hyperæmia and stasis, and the friction of the soft palate against the posterior wall gives rise to irritation, congestion, and hypertrophy of the mucous glands. Colds are a common factor, and the excessive eating of cane-sugar has been noted a common element in their production. Cane-sugar may be toxic if given to any child in sufficiently large amounts.

CLEMENS.

714. HABERMAAS, A. *The treatment of diphtheria with refined and concentrated antitoxin.*

It is shown that the really deleterious effects of the serum are in most instances overlooked and the usual sequelæ of diphtheria itself are wrongly attributed to the use of antitoxin. Most of the unpleasant manifestations following the use of antitoxin serum are largely due to the irritating effects of the horse serum. The author summarizes the results of treatment with the concentrated and refined serum in seventy-five cases. Its antitoxic value is unimpaired and the small

bulk presents more rapid and less painful injection with less local irritation. CLEMENS.

715. HURD, L. M. *Differential diagnosis of tuberculosis and syphilis of the upper respiratory tract.*

The conclusion drawn from the character of the microscopical findings in two doubtful cases here reported in detail is, that certain phases of syphilitic inflammation of the mucosa are histologically identical with those seen in tuberculosis. Giant cells not differing apparently from those seen in tuberculosis may be easily demonstrated. The presumptive diagnosis, whatever the clinical history, should be syphilis when the marked vascular thickening and a number of giant-cells are out of all proportion to, and more prominent than, the coagulation necrosis, unless tubercle bacilli can be demonstrated in the tissues. CLEMENS.

716. SOLIS-COHEN, M. *Latent diphtheria. A public-health problem.*

This paper criticises modern methods in handling diphtheria infection. The simple disinfection of harmless fomites as practised creates a false sense of security and little or no attention is paid to the virulent bacilli often carried about by those who have been in contact with the patients, or by the convalescents themselves. Latent cases are responsible for outbreaks and epidemics of diphtheria; they are just as contagious as the acute membranous type and should be included in the notifiable diseases. It is suggested that two negative cultures should be obtained before any patient in whose throat virulent bacilli have been found should be allowed to be at large. CLEMENS.

b.—OZÆNA.

717. PEREZ. **Ozæna.** *Revista de la societad medica argentina*, 1907.

717. PEREZ. *Ozæna.*

The purpose of this paper is to prove that ozæna is a contagious disease and that the diseases of the nasal sinuses, to which Grünwald has drawn attention, are to be regarded as ozæna. Perez has collected 98 cases in which infection took

place through members of the same family, 36 cases of infection from outside of the family, 16 cases of infection from dogs, and 36 cases with unknown infection. Ozæna is a disease of childhood, and the author's statistics have also shown that it occurs more frequently in females. The ozæna bacillus is gram-negative; it does not fluidify gelatine, does not coagulate milk, and produces indol. It is pathogenic for guinea-pigs, mice, rabbits, and doves. The cultures develop the characteristic fetor of ozæna. Intravenous injections cause disease of the nasal mucosa with the well-known discharge in which the bacilli are found, as well as atrophy of the lower turbinates. Although Grünwald declares that the atrophy is due to the pressure of the scabs, the other symptoms cannot be explained on this basis. According to the author ozæna is a contagious rhino-sinusitis.

BRANDT.

c.—NASAL TUMORS.

718. WRIGHT, J. **Nasal sporozoon (rhinosporidium kinealyi).** *N. Y. Med. Jour.*, Dec. 21, 1907.

719. BECO. **Nasal polypi in children.** *La presse oto-laryngologique*, 1907, Pt. 10.

720. WOLF. **Histology of benign nasal tumors.** *Monatsschr. f. Ohrenheilk.*, 1907, Pt. 8, pp. 429.

721. MÖLLER. **Bleeding nasal polypi.** *Arch. f. Laryngol.*, vol. xx., Pt. 1.

722. UFFENORDE. **Chondroma of the nasal cavity.** *Arch. f. Laryngol.*, vol. xx., Pt. 2.

723. MATHIEU. **On tumors of the nasal fossæ.** *Thèse de Paris*, 1906.

724. DELIE. **Lymphosarcoma of the middle turbinate.** *Arch. internat. d'otol.*, etc., No. 6, 1907.

725. DELIE. **Carcinoma of the inferior turbinate.** *Arch. internat. d'otol.*, etc., No. 5, 1907, p. 547.

718. WRIGHT, J. *Nasal sporozoon (rhinosporidium kinealyi).*

The report of a papillomatous growth removed from the nasal passages leads the observer to pronounce the above diagnosis. The growth occurred in a farmer who had never been away from the neighborhood of Memphis, Tenn. In all cases observed, the organism has occurred in granulation

tissue near the vestibule of the nose, which suggests the conveyance of infection by the finger nails. Very minute white dots stud the tissue and are seen with a low power to be small spheroid cysts embedded in granulation tissue. The structure of the cysts is described in detail, with illustrations, which are regarded as protozoan organisms. There was no evidence of metastasis in any of the cases. CLEMENS.

719. BECO. *Nasal polypi in children.*

Cases of nasal polypi in children are not very frequent. In 30,000 patients there were only 4 cases in children under fourteen years of age; one was a nasal polyp, while the other three originated in the choanæ. BRANDT.

720. WOLF. *Histology of benign nasal tumors.*

Clinical and histological data of a hard fibroma of the nasal introitus, 2 cases of angiofibroma of the nasal floor and anterior extremity of the lower turbinate, one case of papilloma of the septum, and finally a case of polyp of the margin of the choanæ. WITTMAACK.

721. MOLLER. *Bleeding nasal polypi.*

Review of the literature and report of 2 new cases. Both were in women and show a relation to lactation and gestation. VON EICKEN.

722. UFFENORDE. *Chondroma of the nasal cavity.*

Report of a case which is interesting because on posterior rhinoscopy a prominence was found on the posterior ethmoid on the right side. Various methods of operating on the sinuses of the nose are described. In order to reach the frontal, ethmoid, and maxillary sinuses a modification of the Mischaux–Legouest–Mouresche method is given, in which the line of incision is analogous to Killian's method, except that it extends lower down along the side of the nose in order to include the maxillary sinus. VON EICKEN.

723. MATHIEU. *On tumors of the nasal fossæ.*

Chondromata of the nasal cavity and sinuses are unusual. Only 21 cases have been reported in literature, of which 15 were under twenty-five years of age and only 3 over fifty.

The male sex predominated. The tumors varied in size from a hazel-nut to a fist. They were usually of hyaline cartilage. In 8 cases they originated in the cartilaginous septum, 5 from the superior maxillary, 5 from the ethmoid, one from the nasal walls, and one from the occipital bone. The symptoms depend upon the size of the tumor. In only 3 cases was there rapid growth. In 5 cases the tumor recurred. OPPIKOFER.

724. DELIE. *Lymphosarcoma of the middle turbinate.* The sarcoma was limited to the left middle turbinate. The patient was thirty-eight years of age. Recurrence six months after operation. OPPIKOFER.

725. DELIE. *Carcinoma of the inferior turbinate.* A girl, fifteen years of age, presented a carcinoma which started from the posterior half of the right lower turbinate and included the canine fossa. It was removed with resection of the inner wall of the maxillary sinus. No recurrence two years after operation. The diagnosis was confirmed by the microscope. OPPIKOFER.

d.—DISEASES OF THE NASAL SINUSES.

726. DEAN, W. L. **Relation of nasal accessory-sinus trouble with asthma.** *Iowa Med. Jour.*, December, 1907.

727. COFFIN, L. A. **Intracranial complications of disease of the accessory sinuses of the nose.** *Med. Record*, November 9, 1907.

728. GOOD, R. H. **A simple and safe operation on the frontal sinuses by the intranasal route.** *Jour. Am. Med. Assn.*, August 31, 1907.

729. GOLDMANN and KILLIAN. **On the use of the X-rays to determine the extent and diseases of the nasal sinuses.** *Beitrage z. klin. Chirurgie*, vol. liv., Pt. 1.

730. ALBRECHT. **Importance of X-rays for the diagnosis of accessory-sinus disease.** *Arch. internat. d'otol.*, etc., vol. xx., Pt. 2.

731. VOHSEN. **On the value of diaphanoscopy in diseases of the frontal sinus.** *Arch. internat. d'otol.*, etc., vol. xxiv., p. 426.

732. OPPIKOFER. **On the formation of stone in the maxillary cavity.** *Arch. f. Laryngol.*, vol. xx., Pt. 1.

733. ANDEREYA. **Diagnosis and treatment of cyst of the superior maxillary.** *Arch. f. Laryngol.*, vol. xx., Pt. 2.

734. ONODI. **Instruments for the endonasal opening of maxillary sinus and ethmoid cells.** *Arch. f. Laryngol.*, vol. xx., Pt. 2.

735. FREY. **On the treatment of chronic empyema of the maxillary sinus.** *Münch. med. Wochenschr.*, 1907, No. 45.

736. RICHOU. **On the study of cancer of the maxillary antrum.** *Thèse de Paris.*

737. LUBLINSKI. **When is radical operation on the nasal accessory cavities necessary?** *Deutsche med. Wochenschr.*, No. 49, 1907.

738. HAJEK. **On indications for the radical operation of inflammatory diseases of the nasal accessory sinuses.** *Wiener klin. Rundschau*, Nos. 26, 27, 1907.

739. WEIL. **Remarks on the use of the suction treatment in nasal suppuration.** *Wiener med. Wochenschr.*, Nos. 26, 27, 28, 1907.

740. SICARD. **Endocranial complications of frontal-sinus disease.** *Thèse de Toulouse.*

741. MAYER. **On disturbances of vision and blindness of nasal origin.** *Wiener klin. Wochenschr.*, No. 30, 1907.

726. DEAN, W. L. *Relation of nasal accessory-sinus trouble with asthma.*

The writer reports three cases in which the medical and surgical treatment for accessory-sinus disease appeared to relieve the asthmatic trouble almost to a degree of extinction.

CLEMENS.

727. COFFIN, L. A. *Intracranial complications of disease of the accessory sinuses of the nose.*

Cerebral complications are most frequent in disease of the sphenoidal sinus, and least so in that of the ethmoidal of which the writer has never known an instance. CLEMENS.

728. GOOD, R. H. *A simple and safe operation on the frontal sinuses by the intranasal route.*

The instruments used in this operation are: two frontal sinus rasps, two tapering curved chisels, and three brass protectors capable of being bent into various shapes on the flat only. These protectors are used when the author operates with chisels; they are tapering and blunt on the edge so that if the sharp edge of the chisel should strike a bony surface it will glide off instead of penetrating. The rasps are made slightly curved to fit the frontal sinus and with the teeth on the longitudinally concave surface pointing towards the handle. The different steps of the operation are fully described.

CLEMENS.

729. GOLDMANN and KILLIAN. *On the use of the X-rays to determine the extent and diseases of the nasal sinuses.*

The pictures were usually taken in sagittal diameter. The patient was placed with his forehead on the photographic plate, and the diaphragm was so arranged that the occipital protuberance appeared in the centre of its aperture. The authors conclude that the X-ray is an important diagnostic method especially in the sagittal diameter of the skull which can give us information on the topographic anatomic relation of the accessory sinuses and their diseases. It ranks as one of the most important methods of examination, but cannot in itself take the place of the other methods. Excellent reproductions of the Röntgen photographs are given. HARTMANN.

730. ALBRECHT. *Importance of X-rays for the diagnosis of accessory-sinus disease.*

The author has observed on patients and cadavers the value of the X-ray pictures taken in the antero-posterior diameter in diseases of the accessory sinuses, and concludes that in suppuration of the maxillary sinuses the method is not of great value, but serves a better purpose in tumors of the superior maxillary. This method is of great importance in suppurations of the frontal sinus, although one cannot rely entirely upon the X-ray picture. The radiographs of the ethmoid cells are very important, and show from a slight cloudiness to a marked shadow according as one or more of the cells are affected. According to the author, a diseased mucous membrane may cause a cloudiness of the Röntgen picture, as well as pus itself. VON EICKEN.

731. VOHSEN. *On the value of diaphanoscopy in diseases of the frontal sinus.*

The author discusses the value of transillumination in disease of the frontal sinus and compares diaphanoscopy with the results given by radiographs. He comes to the conclusion that in general radiographs do not accomplish more than diaphanoscopy. OPPIKOFER.

732. OPPIKOFER. *On the formation of stone in the maxillary cavity.*

In a patient sixty years of age with chronic suppuration

of the right maxillary sinus, the antrum was operated upon according to the Caldwell–Luc method, and a concretion about the size of a hazel-nut with a rough surface was found and subjected to careful chemical analysis. Of further interest in the case was the fact that on histological examination the mucous membrane was found to have undergone carcinomatous degeneration. Normal conditions were found to be present on examination three years afterward.

VON EICKEN.

733. ANDEREYA. *Diagnosis and treatment of cyst of the superior maxillary.*

Report of six cases. In the treatment of cyst it is necessary only to remove part of the cyst wall and establish a free communication with the mouth. If this is done healing will soon follow. VON EICKEN.

734. ONODI. *Instruments for the endonasal opening of maxillary sinus and ethmoid cells.*

The first instrument is a combination of trocar and die. It is possible with this to open up the maxillary antrum endonasally either in the lower or middle portion. The second instrument consists of a strong sharp forceps with which the ethmoid cells can be easily opened.

VON EICKEN.

735. FREY. *On the treatment of chronic empyema of the maxillary sinus.*

Frey reports twenty-one patients operated upon by the Kretschmann–Denker method. Seventeen are already cured and in the other four healing is expected. The entire after-treatment occupies sixteen and one-half days. SCHEIBE.

736. RICHOU. *On the study of cancer of the maxillary antrum.*

On the basis of seventeen cases of which only thirteen were examined histologically (eight sarcoma and five carcinoma) the author gives the etiology, pathological anatomy, course, diagnosis, and treatment of malignant tumors of the superior maxillary. The case-histories are fully discussed, and finally the work of other French authors in the literature is reviewed. OPPIKOFER.

737. LUBLINSKI. *When is radical operation on the nasal cavities necessary?*

The author is of the opinion that in acute disease of the nasal accessory sinuses radical operation is scarcely ever indicated; inflammation of the antrum of Highmore especially rarely calls for operative interference, except at most a puncture from the nose with a few irrigations; in inflammation of the frontal sinus the removal of the anterior extremity of the middle turbinate will generally bring about the desired result. In chronic disease of the superior maxillary sinus, if a diseased tooth is the cause, treatment can be undertaken by way of the alveolus when the tooth has been removed. In the balance of the cases, opening and irrigation by way of the inferior meatus will usually be followed by healing. The radical operation is only indicated in cases with carious bone and in old neglected cases, but a lasting result cannot always be guaranteed. In chronic frontal-sinus suppuration the author considers the radical operation only indicated when the process has extended to the orbit or brain. The ethmoid and sphenoid sinuses are rarely involved alone; therefore, the same indications hold for these cavities as for the frontal sinus.

NOLTENIUS.

738. HAJEK. *On indications for the radical operation of inflammatory diseases of the nasal accessory sinuses.*

The question whether it is absolutely necessary to resort to radical operation in a suppuration of the maxillary cavity is answered by the author by stating that the radical operation is indicated only in exceptional cases where there is complicating bone disease, or where the cavity is filled with polypi and cysts. The indications may also be physical or social. Ninety to ninety-five per cent. of the cases of acute frontal-sinus affection heal under treatment with aspirin and rest in bed. In acute cases of suppuration in which retention symptoms are present, the author recommends resection of the anterior end of the middle turbinate, as well as in the large majority of cases of chronic empyema of the frontal sinus which have lasted for years and in which no irreparable changes have taken place in the mucous membrane or in the bone. Ninety per cent. of the cases of chronic

frontal-sinus suppuration will yield to this treatment. Of the remaining 10% there may be persistence of the discharge, intense headache, and tenderness of the sinus wall in 5%, and in such cases it will be necessary to operate. In the other 5% in which there is merely hypersecretion, it is wise to wait after resection of the turbinate, the author having in some cases waited as long as a year.

The indications for radical operation according to the author are: 1. When the external examination shows that the bone structure is affected. 2. When there is a suspicion that the process may extend to dura and meninges. In disease of the ethmoid labyrinth it is safe to wait as long as there is discharge of catarrhal secretion; when retention occurs an opening must be made. In suppuration of the sphenoid cavity in old, severe cases, after resection of the middle turbinate the sphenoid is exposed and the opening widened. Of 7000 new cases, about 10 demanded radical operation of the maxillary antrum and 5 or 6 of the frontal sinus. In chronic empyema irrigation through the natural openings should be attempted. Opening through the alveolus should only be practised when a diseased root of a tooth is suspected; in other cases the author advocates opening the maxillary antrum from below with resection of the inferior turbinate. In general the author believes that operation is done much too frequently. WANNER.

739. WEIL. *Remarks on the use of the suction treatment in nasal suppuration.*

By means of a glass model, aspiration of the frontal sinus, ethmoid cells, maxillary antrum, and nasal cavities is shown. These cavities are filled with a solution of starch colored with iodin. On moderate suction and at first on strong suction there is no change in the solution. On continuous forced suction a little fluid appears at the end of the duct and a small air vesicle rises on cessation of suction; this is repeated in greater degree at every suction. At the same time the fluid in the cavity which represents the superior maxillary is aspirated, and at the end of the experiment half of the fluid aspirated from the frontal sinus is found at the bottom of the maxillary antrum. On further experiments in which the

maxillary antrum alone was tested, aspiration was followed by the same results as long as fluid was present above the level of the opening. After a marked aspiration, about one fifth atmosphere, the fluid from the middle passage is observed to be forced against the top of the frontal sinus. If the level of the fluid in the superior maxillary is below the opening, aspiration has no result; if, however, the opening is lower, fluid can be aspirated. These experiments show that the cavities may be aspirated and emptied. This is easier if the walls are not firm. Of particular interest is the experiment that through aspiration, fluid can be forced into empty cavities. The danger of infecting the ear is a definite one, because on cessation of aspiration any pus situated in the tubal ostium may be forced into the tympanum. This method can be used carefully for diagnostic purposes, but should not be used therapeutically in nasal suppuration, especially in acute cases. WANNER.

740. SICARD. *Endocranial complications of frontal-sinus disease.*

The author has collected 32 cases from the literature, which, through acute or chronic frontal-sinus suppuration, led to endocranial complications. The symptoms and course are described. In operating on the frontal sinus, forcible curetting should not be practised. OPPIKOFER.

741. MAYER. *On disturbances of vision and blindness of nasal origin.*

In a patient, seventy-six years of age, who suffered for three or four years from a right-sided empyema of the nasal accessory cavities, sudden blindness of the right eye developed, following an acute congestion of the nasal mucous membrane. During the next three weeks, vision in the left eye was reduced three-tenths. In the middle meatus on the right side there were polypi and pus. On opening the maxillary and sphenoid sinuses, also the posterior ethmoid cells on the right side, vision on the left side improved until it became nearly normal. The author believes the cause of the loss of vision to have been, in disease of the sphenoid sinus and posterior ethmoid cells, through a direct extension of the inflammation along

the connection between the venous system of the nasal accessory sinuses and the ophthalmic plexus of veins. The loss of sight in the right eye was due to extension of the inflammation of the right optic nerve to the left. WANNER.

e.—OTHER DISEASES OF THE NOSE.

742. MACKENTY, JNO. E. **Congenital occlusion of the choanæ.** *Med. Record*, September 7, 1907.

743. JACKSON, CHEVALIER. **Septal perforations; their closure by plastic operation.** *Med. Record*, October 12, 1907.

744. WEIGHTMAN, W. A. **Massage of the inferior turbinates in the treatment of atrophic rhinitis.** *Post-Graduate*, August, 1907.

745. ROSE, FRANK A. **Membranous rhinitis.** *The practitioner*, 1908, vol. lxxx., p. 135.

746. JOSEPH. **The correction of crooked nose.** *Deutsche med. Wochenschr.*, No. 49, 1907.

747. DE CIGNA. **Premonitory epistaxis.** *Arch. internat. d'otol.*, etc., vol. xxiv., p. 105.

748. SIEBENMANN. **Involvement of the mucous membrane in general hyperkeratosis of the skin.** *Arch. f. Laryng.*, vol. xx., Pt. 1.

749. HÜRLIMAUN. **On the treatment of hay fever.** *Korrespondenzblatt f. Schweizerärzte*, No. 15, 1907.

750. HEYMANN. **On hay fever.** *Berl. klin. Wochenschr.*, 1907, No. 13.

742. MACKENTY, JNO. E. *Congenital occlusion of the choanæ.*

Of the two cases reported, one was complete occlusion and the other unilateral. In one case there was discharge from the right ear and a gradual increasing deafness in both. The operation was practically the same in both cases: after incising the mucous membrane the bone was removed with punch and forceps, going deep into the floor and inner wall but avoiding the outer wall. The results obtained were found four years later to be: perfect breathing, the nasal membranes still atrophic, the hearing increased in the left ear but not in the right. No packing or dilator was used to keep the space open. CLEMENS.

743. JACKSON, CHEVALIER. *Septal perforations; their closure by plastic operation.*

The operation consists in taking a large round or tongue-shaped flap from the mucosa and submucosa over the inferior

turbinal. It must be at least 6*mm* larger vertically than the perforation and usually as long as the turbinal itself. The flap is raised and, after freshening the edges of the perforation, is stitched in place. If the perforation is large it is well to duplicate the operation on the other side. The synechia resulting from the union of the flap with the septum is easily removed by clipping out a section of the bridge formed by the flap and inserting a strip of bismuth lint for five days. All the excess of the inferior turbinal must be removed or a troublesome synechia will result. The operation may be used on cicatricial septa and on those where the cartilage has been removed by a submucous operation.

CLEMENS.

744. WEIGHTMAN, W. A. *Massage of the inferior turbinates in the treatment of atrophic rhinitis.*

Four cases are here reported in which massage of the inferior turbinates was resorted to in the treatment of atrophic rhinitis. In addition to local cleanliness, the inferior turbinates were massaged twice a week by a gentle stroking with an applicator covered with a pledget of cotton soaked in Dobell's solution. Considerable improvement was observed at the end of one month. The mucous membrane became more nearly normal in appearance, the dryness disappeared, and the function of smell returned. The administration of potass. iodide in small doses aided materially by increasing the flow of pharyngeal mucus. CLEMENS.

745. ROSE, FRANK A. *Membranous rhinitis.*

The symptoms and treatment, based on eight cases, are reviewed. Rose strongly upholds the view that the bacillus of membranous rhinitis and that of diphtheria are identical.

HUNTER TOD.

746. JOSEPH. *The correction of crooked nose.*

Joseph reports on 23 cases of nasal deformity which he has operated and cured. The deformity was partly cartilaginous and partly bony. Illustrations before and after operation show the excellent results obtained. Only three cases were operated under general narcosis; in all the others local anæsthesia was employed—eusemin, a combination of cocain

and adrenalin. The cartilaginous deformity was corrected by boring a hole in the bone close to the edge of the pyriform incisure, then passing a strong silk thread through this opening; the silk thread was also passed through the cartilaginous septum, which was then drawn close to the opening in the bone and fixed in this position for several weeks until the normal position of the septum was assured. In the correction of bony deformities a small triangular piece of bone is resected from the nasal process of the left superior maxilla if the nose is turned toward the right; on the other side, linear separation of the bone. An apparatus must be worn on the operated nose until healing is complete. This treatment is carried out intranasally and subcutaneously. NOLTENIUS.

747. DE CIGNA. *Premonitory epistaxis.*

The author gives the case-histories of twenty-three aged individuals in whom epistaxis preceded cerebral hemorrhage. In arteriosclerosis epistaxis must be regarded as an urgent symptom pointing to the need of treatment. OPPIKOFER.

748. SIEBENMANN. *Involvement of the mucous membrane in general hyperkeratosis of the skin.*

Report of a case of ichthyosis hyperkeratosis in which the mucous membrane was also involved; also complete report of a case of ichthyosiform disease. VON EICKEN.

749. HÖRLIMAUN. *On the treatment of hay fever.*

Two stubborn cases of hay fever were speedily cured on inhaling dry hot air. A receptacle containing six electric red lights was tilted over the patient's face; free air was admitted on the sides. OPPIKOFER.

750. HEYMANN. *On hay fever.*

A number of hay-fever patients were treated with thyroidin. Of nineteen patients, three stated that they escaped any attack, while in the remaining sixteen the attack was only a mild one. The severity of the action was in proportion to the length of the cure. MÜLLER.

f.—NASO-PHARYNX.

751. LINDT. **Clinical and histological observations on adenoids.** *Korrespondenzblatt f. Schweizerärtze*, 1907, Nos. 17 and 18.

752. CASABIANCA. **Adenoid vegetations in nurslings.** *Thèse de Bordeaux.*

751. LINDT. *Clinical and histological observations on adenoids.*

The histology of adenoids was investigated in fifty specimens. Lindt comes to the same conclusion as Brieger, that, notwithstanding the variations in constitution the histological findings in adenoids are nearly always the same, consequently they furnish no information as to the health of the individual or the origin of the hyperplasia. The author also discusses the involution of the pharyngeal tonsil, its liability to recur, and its physiological purpose. In regard to the last, the author belongs to the adherents of the protective theory. The indications and prognosis of the Gottstein operation are described. The author is not in favor of narcosis. Of fifty cases of adenoids, microscopic examination revealed tuberculosis in five, three adults and two children, who were constitutionally weak. At the time of operation there were no other evidences of tuberculosis. In one of the cases, a boy four and one-half years of age, a right-sided middle-ear tuberculosis subsequently developed. While tuberculosis of the pharyngeal tonsil was latent in this patient, it led in the middle ear to suppuration and caries. OPPIKOFER.

752. CASABIANCA. *Adenoid vegetations in nurslings.*

The author believes that adenoid vegetations in nurslings are not unusual, and unless early operation is resorted to, the prognosis of this disease is serious. OPPIKOFER.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

753. WHITE, E. H. **Pathology of adenoids and adenoid tuberculosis.** *Am. Jour. Med. Sciences*, August, 1907.

754. BYINGTON, J. F. **A new adenoid curette for Rosenmüller's fossa.** *Jour. Am. Med. Assn.*, Oct. 5, 1907.

755. MORSE, JOHN L. **Adenoids in infancy.** *Jour. Am. Med. Assn.*, Nov. 9, 1907.

756. GRADLE, H. **Painless removal of adenoids.** *Chicago Med. Recorder*, Nov. 15, 1907.

757. TOD, HUNTER. **Venous angioma of the soft palate.** *Proceedings of the Royal Society of Medicine, Laryngol. Section*, vol. i., No. 6, 1908, p. 13.

758. LEGG, T. P. **So-called adenomata of the palate.** *The Practitioner*, vol. lxxx., 1908, p. 333.

759. NEUMAN, DANIEL S. **Improvement of the voice from tonsillotomy.** *Denver Med. Times*, July, 1907.

760. HAGER, DANIEL. **A tonsil pillar separator.** *Jour. Am. Med. Assn.*, July 6, 1907.

761. CONNAL, J. G. **Abnormal pulsating vessels in the pharynx.** *Jour. of Laryngology*, vol. xxiii., 1908, p. 130.

762. ROBERTS, J. B. **Improved methods in successful operative treatment of cleft palate.** *Am. Jour. Med. Sciences*, July, 1907.

763. ROY, J. N. **Primary melanosis of the palate; naso-buccal fistula of recent sarcomatous origin.** *Med. Record*, Nov. 2, 1907.

764. FALLAS. **Abscess of the neck of bucco-pharyngeal origin.** *La presse oto-laryngol.*, 1907, Pt. 8.

765. BARTH. **Physiology of the tonsils and the indications for their removal.** *Deutsche med. Wochenschr.*, No. 49, 1907.

766. ORLEANSKI. **On the blood- and lymph-vessels of the tonsils, especially in relation to the question of post-operative hemorrhage.** *Russische Monatsschr. f. Ohrenhlk.*, etc., July, 1907.

767. CONSTANTIN. **Tonsillar hemorrhages.** *Thèse de Toulouse*, 1905.

768. HERVE. **Treatment of tonsillar abscess.** *Thèse de Bordeaux.*

769. TRAPENARD. **Relation of buccal leucoplastica to syphilis.** *Thèse de Paris.*

770. BLEGVAD. **Black tongue (lingua villosa nigra).** *Arch. f. Laryngol.*, vol. xx., Pt. 2.

771. OKUNEW. **On the question of black hair tongue.** *Monatsschr. f. Ohrenhlk.*, May and June, 1907.

772. BAUMGARTEN. **A case of peripheral unilateral hypoglossal paralysis, with hemiatrophy of the tongue.** *Wiener med. Wochenschr.*, No. 31, 1907.

753. WHITE, E. H. *Pathology of adenoids and adenoid tuberculosis.*

Seventy-five adenoids were examined histologically and in twelve cases this was supplemented by the inoculation of guinea-pigs. In five cases, histological evidence of tuberculosis was found, therefore this disease does not appear to be an important factor in the production of adenoid hypertrophy. But in the development of pulmonary tuberculosis the presence of adenoids may sometimes be direct channels of infection. Their importance is probably more often indirect by predisposing to catarrhal inflammation of the upper respiratory tract. CLEMENS.

754. BYINGTON, J. F. *A new adenoid curette for Rosenmüller's fossa.*

The instrument is a side-cutting curette sharpened only on the posterior and superior portions of the loop. The ring forms an obtuse angle with the shank, which renders it possible to bring the entire posterior cutting edge in contact with the posterior-superior wall of the fossa and away from the posterior lip of the Eustachian orifice. CLEMENS.

755. MORSE, JOHN L. *Adenoids in infancy.*

Adenoids are considered a very common cause of colds in the head and snuffles in infancy, also irritating coughs without physical signs especially troublesome at night. Attacks of laryngitis and spasmodic croup, sleeplessness, even without marked symptoms of nasal obstruction, should create suspicion of their presence. The operation is considered free from danger and the only cure. CLEMENS.

756. GRADLE, H. *Painless removal of adenoids.*

After spraying the pharyngeal mucous membrane with cocain, a hypodermic needle is thrust as high as possible into the posterior wall of the pharynx, and a mixture of adrenalin and cocain is injected into the membrane. The needle is introduced through a blunt canula. After ten minutes the adenotomy will be painless. The same solution is used for tonsillotomies. The only pain experienced is when traction is made, especially with a snare. CLEMENS.

757. TOD, HUNTER. *Venous angioma of the soft palate.*

A large, smooth, globular swelling of a bluish-purplish color occupied the region of the soft and the posterior portion of the hard palate on the left side. It was markedly compressible on pressure and there seemed to be some absorption of the posterior part of the hard palate. Excision by operation seemed impossible. Ligature of the branches of the external carotid, in the hope of diminishing the arterial supply and thus rendering treatment by electrolysis less dangerous, did not affect the size of the growth.

HUNTER TOD.

758. LEGG, T. P. *So-called adenomata of the palate.*

The paper is based on six cases and is illustrated by four

plates showing microscopic sections of the tumors. These tumors occur at all ages. They are more frequently found in the soft palate and when in the hard palate are generally situated at its posterior part. The presence of a tumor is not infrequently discovered accidentally owing to the only symptom being that of inconvenience when it has reached a large size. Growth is usually slow and varies, frequently rapidly increasing in size after having existed for a long period. The tumors are usually solid, only rarely containing cysts. They have a definite capsule and are not pedunculated. Enucleation is the best and easiest method of treatment, an incision being made through the mucous membrane over the tumor.

In the cases quoted above there has been no recurrence varying over a period of twelve months to more than five years.

The most striking feature of these tumors histologically, is the complexity of the arrangement of the different elements and hence the difficulty of classification. HUNTER TOD.

759. NEUMAN, DANIEL S. *Improvement of the voice from tonsillotomy.*

That a complete tonsillotomy benefits the voice is based on the study of forty-four cases. After a period of two years, an examination of all the cases showed that the improvement had remained permanent. CLEMENS.

760. HAGER, DANIEL. *A tonsil pillar separator.*

This instrument is designed to overcome the difficulties of separating the adhesions of the tonsil and pillar. The blade of the instrument is set at such an angle as will conform to the anatomical curvature of the tonsil and fossa and, by reversing it, is adapted to the curvature of either back or front pillar. CLEMENS.

761. CONNAL, J. G. *Abnormal pulsating vessels in the pharynx.*

Twelve cases are cited; nine in adults, three in children. The condition was discovered in the course of routine examination of the pharynx. The pulsating vessel was situated behind the posterior pillar of the fauces and in most cases

ascended into the naso-pharynx. Pressure over the common carotid diminished or abolished pulsation. The vessel involved was thought to be the ascending pharyngeal, and not to be so rare an occurrence as generally supposed. Two plates are appended illustrating the abnormality.

HUNTER TOD.

762. ROBERTS, J. B. *Improved methods in successful operative treatment of cleft palate.*

It is recommended that cleft palate should be operated on as soon after birth as possible. Accompanying harelip should not be treated until after the palate operation. Brophy's tie-beam method is generally used when the operation is done during the first six months, and after this age the Lane method should be employed. Mechanical appliances to close the fissure are inferior to operative treatment, which has a low mortality. CLEMENS.

763. ROY, J. N. *Primary melanosis of the palate; naso-buccal fistula of recent sarcomatous origin.*

This neoplasm did not begin with melanosis, and, sixteen years after it appeared, the spot on the palate was only *6mm* in diameter and was on a level with the mucous membrane of the palate. No co-existing lesions of the eye or skin were present. The naso-buccal fistula appeared quite recently and has rapidly progressed. CLEMENS.

764. FALLAS. *Abscess of the neck of bucco-pharyngeal origin.*

Four cases of severe abscess of the neck are reported where the entrance of infection was the lingual tonsil. Of these, three ended fatally. The author advises that these abscesses be opened early. There are two ways of reaching the abscess: (1) from the posterior wall of the sterno-cleido-mastoid muscle; (2) after the sterno-cleido-mastoid muscle has been pushed aside, below the middle aponeurosis of the neck. The use of chloroform is contra-indicated. BRANDT.

765. BARTH. *Physiology of the tonsils and the indications for their removal.*

According to Barth, the tonsils like the lymph glands are a

protective apparatus and hypertrophy of these organs is to be regarded as increased function. Removal of the tonsils is necessary when their hypertrophy causes local changes, and when, owing to preceding inflammations they contain necrotic foci or abscesses which in addition to the local disease may cause a general infection. In operating it is desirable to avoid the formation of scar tissue and that the character of the mucous membrane be preserved. NOLTENIUS.

766. ORLEANSKI. *On the blood- and lymph-vessels of the tonsils, especially in relation to the question of post-operative hemorrhage.*

Complete description of the blood- and lymph-vessels of the tonsils. SACHER.

767. CONSTANTIN. *Tonsillar hemorrhages.*

There is no method for the removal of tonsils which precludes the possibility of hemorrhage. The various methods of controlling this hemorrhage are described, also suitable instruments are illustrated. The simple method of a firm gauze tampon held in contact with the wound by means of a long forceps is not sufficiently emphasized. OPPIKOFER.

768. HERVE. *Treatment of tonsillar abscess.*

In every case of peritonsillitis operation alone is serviceable. Incision should be practised with the galvano-cautery, which prevents after-hemorrhage and by keeping the wound open facilitates the escape of pus. OPPIKOFER.

769. TRAPENARD. *Relation of buccal leucoplasia to syphilis.*

In 126 patients with buccal leucoplasia, 89 suffered from syphilis, in 27 this condition was overlooked, and in 10 there was not the slightest evidence of syphilis. In spite of this last group the author believes that leucoplasia buccalis is of syphilitic origin and recommends that every case be treated with mercury. Even though a decided improvement is not always obtained by this treatment, still a worse result, as for instance the formation of carcinoma, can usually be prevented. OPPIKOFER.

770. BLEGVAD. *Black tongue.*

Ten cases are reported which were examined microscopically

and bacteriologically. The reports of other authors are given; the literature shows 110 cases. The author concludes that no hypothesis advanced up to the present is satisfactory. In the author's opinion, black tongue is due to an elongation of the filiform papillæ, possibly through irritation, and that these papillæ are dyed black in color, not from bacteriological causes but chemically through the ingesta (spices, wein, tobacco, or medicines). The treatment consists in the application of a 10% hydrogen-peroxid solution. VON EICKEN.

771. OKUNEW. *On the question of black hair tongue.*

Review of the literature and report of 2 cases, with careful histological examination of the hair, which was 1½*cm* long. Satisfactory treatment was obtained by closely removing the hair and making daily application of a 1% to 2% solution of iodin and glycerine over the diseased parts for a long time. Smoking should be interdicted. SACHER.

772. BAUMGARTEN. *A case of peripheral unilateral hypoglossal paralysis, with hemiatrophy of the tongue.*

A child, five years old, was operated upon at the age of one and one-half years for enlargement of the lymphatic glands of the neck. Shortly after the mother noticed that the child's tongue was directed to one side and that its speech became indistinct. As the other cerebral nerves were normal, and as there were no brain symptoms, peripheral paralysis was diagnosed, the author being of the opinion that the nerve was probably injured at operation, the possible site being beneath the anastomosis with the nerve branches of the second and third cervical roots, as the genio-hyoid and thyrohoid were also involved. An illustration and a review of the literature complete the article. WANNER.

ILLUSTRATING DR. SHAMBAUGH'S ARTICLE ON "THE MEMBRANA TECTORIA AND THE THEORY OF TONE PERCEPTION."

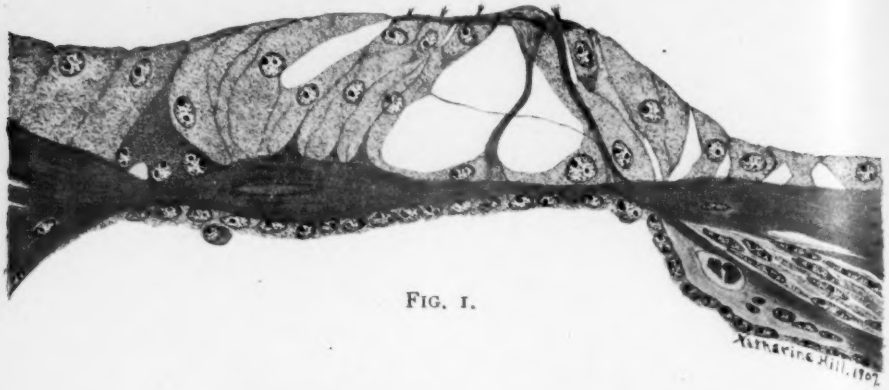

FIG. 1.

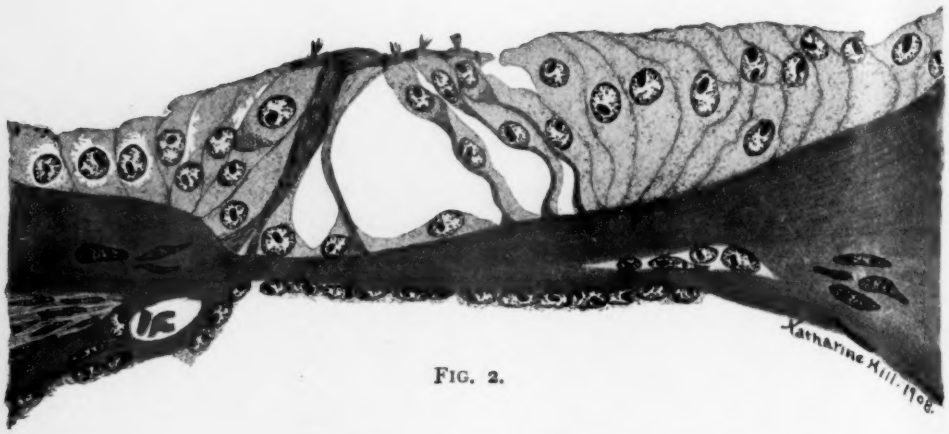

FIG. 2.

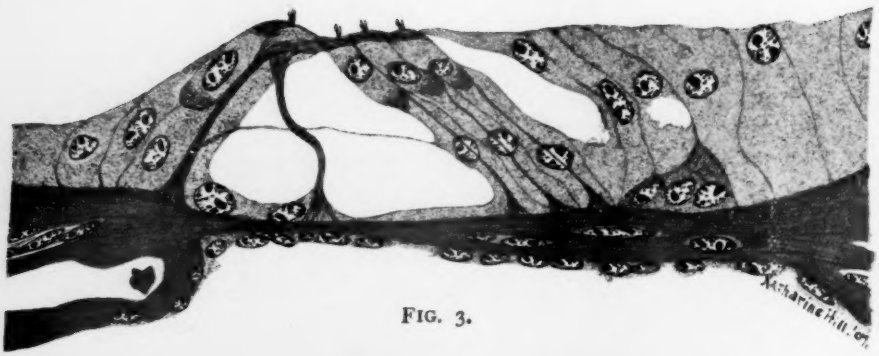

FIG. 3.

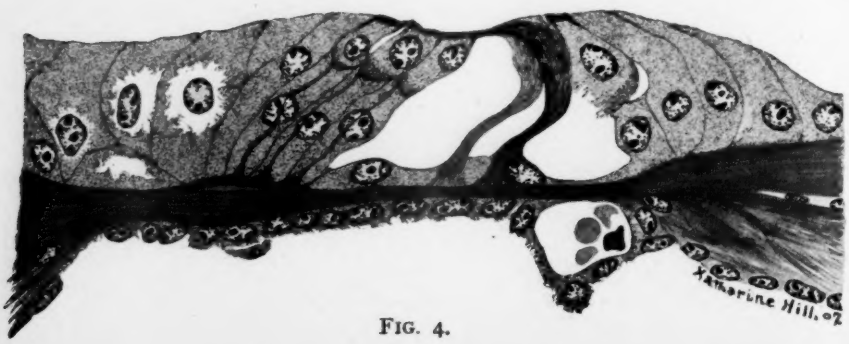

FIG. 4.